

# Consumer Reports

"FACTS YOU NEED  
BEFORE YOU BUY"

VOL. 11, NO. 5

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PREFABRICATED HOUSES • "BIG THREE" AUTO RAT-  
INGS • BUYING A CAR • VACUUM CLEANERS • PRES-  
SURE COOKERS • TABLE MODEL RADIOS • AQUELLA •  
WINDOW BOXES • SUNBATHING • YOUR CHILD

# CONSUMER REPORTS

Volume 11, No. 5

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## Famine and Inflation

Lots of people are scared stiff about the destructiveness of atom bombs. Yet, in terms of human life and human suffering, the failure of the well-fed nations to rush every morsel of food that can be spared to the millions of starving people in Europe and Asia can do far more damage than a shower of atom bombs.

And while we're making comparisons with atom bombs, it is our opinion that if Congress ordained that the Army carry out a test of the effects of atom bombs on steel and concrete cities by dropping atom bombs on New York, Chicago and San Francisco, it would do less long-term injury to the American people than it would by carrying through the House-approved OPA-wrecking bill. In other words, we doubt that it's worse to send a few hundred thousand persons to instant death by nuclear chain reaction than to set under way an inflationary chain reaction which would wreck the well-being of a hundred million people, cause ultimate unemployment of twenty million or more, and bring years of hunger and malnutrition to millions.

Many of the experts consider death by starvation for tens of millions abroad and the disastrous consequences of run-away inflation at home as inevitable. Further, they see the orderly, peaceful development of the entire world, not just of the countries immediately con-

cerned, shattered by either mass starvation abroad or a sharp inflationary crisis in the United States.

Much starvation and a good deal of inflation have indeed become unavoidable because of the failures of those (not excluding most consumers) who could have averted both. But the people's reaction to the House action on price control, the way they jumped on Congress with both feet for their attempted sell-out to special interests, gives cause for hope that disaster can be averted.

Probably not in the next generation will the people face a crisis more grave than the one they face at this moment. And action by the people is needed as it has seldom in this country's history been needed before: action that will send more and more shiploads of food to the famine-stricken countries; and action that will hold inflationary forces in check until production has caught up with demand.

Because their opportunities for being informed are better than those of most other consumers, we believe that the members of Consumers Union have a special obligation at this time to use their pens and their voices for the benefit of all. We cannot too strongly urge you to act, and to get organizations to which you belong, to act quickly and vigorously to help persuade our officials and representatives to take the steps that will end world famine and the threat of run-away inflation.

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# CHEVROLET—FORD—PLYMOUTH

*CU's auto consultant tells you how to make a choice  
among postwar models of the famous "All Three"*

In 1941, the last full year in which new model cars were sold, almost every second buyer—actually, 23 out of 51— took one of the "all three" cars—*Ford, Chevrolet or Plymouth*. Every fourth new car buyer drove home in a *Chevrolet*. These three makes are the true mass-production cars, and the most important group for any prospective car buyer to know about, whatever price he intends to pay.

There is no evidence to prove that a car priced higher than the *Ford, Chevrolet or Plymouth* will deliver more miles per dollar in the long run. It is true that operating costs—particularly gas expense—will be less for the *Willys, Studebaker Champion or Nash 600*, but this fact is chiefly important to very high-mileage drivers. There are more people in more places who can repair the "all three" cars—especially the *Chevrolet*—than any others. The three makes suffer the smallest percentage of depreciation when resold, and they have climbed so far out of the "tin lizzie" class in size, comfort and price that they can no longer be called "small cars" or "cheap cars." If anything, they have become too large and, incidentally, too expensive.

The three cars—there are really four, since *Ford* offers a *Six* as well as the *V-8*—are quite different from each other. Unless a buyer understands what the differences mean in terms of car performance, he cannot choose wisely among them, or get the car which best fits his needs.

## CHEVROLET

The 1946 *Chevrolet* is the prewar model, with almost no mechanical changes. Since 1938, in fact, when the engine was enlarged to its present

size, only comparatively minor changes have been made in the *Chevrolet*, except for the cross lever type of knee action adopted in 1939.

From a statistical point of view, the *Chevrolet* is not very impressive, as the table shows. Why, then, is the *Chevrolet* rated a "Best Buy" in this class, as it has frequently been in the past? Chiefly because, in the opinion of CU's consultant, the *Chevrolet* is on the whole more certain to deliver satisfactory service at low maintenance costs and reasonably low operating costs to a wider range of drivers throughout its lifetime than any other car in the "all three" group, if not, in fact, in any group.

The *Chevrolet* has, for example, an engine better protected by its lubrication system from cold-starting wear or high oil consumption due to wear than any other car in the group. These are the most serious kinds of wear encountered in normal driving. Furthermore, the *Chevrolet* develops its maximum pulling power in high gear at about 24 miles per hour—a very usable characteristic for average service. The car is relatively accessible for most repairs; it rides well, and has brakes that are easy to adjust.

## FORD

The *Ford 6* and *V-8* are alike except for their engines and their rear axle ratios. *Ford* continues, for 1946, to experiment with springing, in an endeavor to equal the riding qualities of competing cars while retaining the familiar cross springs and radius-rod supported front axle. The latest *Ford* has more and thinner spring leaves, front and rear. While the *Ford* front suspension may require less maintenance expense than "knee action" sus-

pensions (and certainly so if lubrication of the latter is neglected), it does not offer as much riding comfort as the *Chevrolet* and the *Plymouth*, particularly on the back seat. *Ford* clutch and hydraulic brakes are very good. The body, unchanged from 1942, has the biggest windshield and window area in the group. Seating space is good, both in front and rear.

The 8-cylinder engine in the 1946 model is the 100 HP *V-8* used heretofore in the *Mercury*, and with modifications in the larger *Ford* trucks. An "extra charge" of \$25 is made for this engine, although no other size engine is offered in the *V-8*. The big engine is used with a very low rear axle ratio—3.54 to 1—which brings the gas mixture per mile (see table) down to a competitive figure in the "all three" group. The engineering disadvantages of this arrangement are serious, besides the fact that a large engine is harder to warm up, requires more antifreeze, etc. The 1946 *Ford* attains its maximum high gear pulling power at 45 mph and its maximum horsepower at 86 mph, obviously relatively useless performance characteristics for most drivers. The *V-8* is primarily a high-speed, open-road car, and a very poor choice for doing the family shopping or driving a few miles to work. It is also, incidentally, a poor choice for winding mountainous roads at high altitudes.

Quite a few changes have appeared in the 1946 *V-8* engine. The most important of these provides for an increased supply of oil to the cylinder walls and other engine parts in order to reduce engine wear and consequent high oil consumption. To help control the added volume of oil, *Ford* pistons, now of aluminum, have four

## Statistical Comparison of the Cars

	Over-all Length (in.)	Taxable H.P.	Shipping Weight (lb.)	Tire Capa- city (lb.)	Gear Ratio (to 1)	Power Ranking (in group)	Compres- sion Ratio (to 1)	Piston Displace- ment (cu. in.)	Approx. Engine Revs. per Mile	Gas Mixture Per Mile (cu. ft.)	Brake Loading (lb. per sq. in.)
CHEVROLET .....	197.75	29.40	3125	385	4.11	1	6.50	216.5	3066	192	26
FORD 6 .....	196	26.10	3179	331	3.78	2	6.70	226	2820	184	24.8
PLYMOUTH .....	196.75	25.35	3060	450	3.90	3	6.80	217.8	2910	183	25.7
FORD V-8 .....	196	32.51	3200	360	3.54	4	6.40	239.4	2640	183	26

### Selecting One of the "All Three" Cars

For short distance driving, especially in Winter; for urban-suburban use anytime, or where exceptionally good lugging power is desired: *Chevrolet*.

For average use—errands, shopping, occasional long trips or sales trips at normal speeds (below 60 mph) where a minimum of car abuse is expected: *Chevrolet*, *Plymouth* or *Ford 6*, in the order named.

Where maximum power over the whole range of speeds or other *Ford* features mentioned above outweigh deficient riding qualities; where bad road conditions would be hard on knee action suspensions because of the presence of corrosive salts, dust or heavy mud: *Ford 6*.

For open-road, long-distance or high-speed driving (above 60 mph): *Ford V-8*.

rings instead of three as in previous models. And oil filters and an oil bath air cleaner are also included. While these changes have undoubtedly been tested in military equipment, it remains to be seen what effect they will have on ordinary passenger cars. Driving conditions and the various types of wear which result from use by private owners are not duplicated in military or commercial service.

The *Ford 6*, introduced in 1941 and now a war veteran, offers buyers the good points of the *Ford* chassis and body in combination with much more usable engine characteristics than those of the *V-8*. Employing a 3.78 axle ratio, the *Ford 6* develops its maximum high gear pulling power at 30 mph and its peak horsepower at 70. The engine is smooth, rugged, easier to maintain and more accessible than the *V-8*, as well as more

economical of fuel at moderate car speeds.

### PLYMOUTH

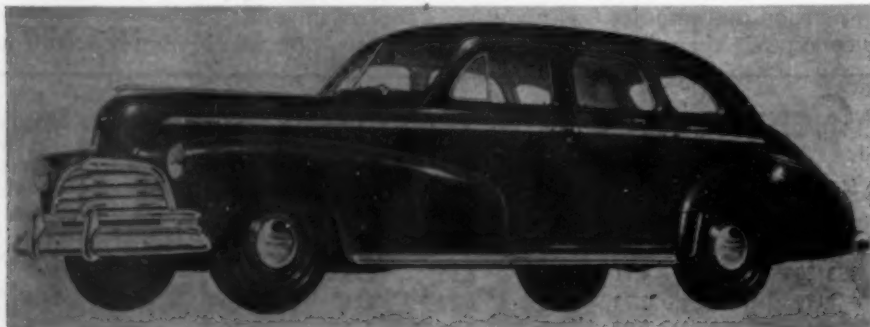
The chief 1946 changes in the *Plymouth* include a really improved braking system, push-button instead of foot-pedal starting, a return to aluminum pistons, and—in common with all Chrysler lines—a better location of the coil and generator regulator. The 1942 *Plymouth*, however, was practically a new car. It had a larger engine that ran more slowly than previous models, a new frame and a new body, between the *Ford* and the *Chevrolet* bodies in class area.

The maximum pulling power of the 1946 *Plymouth* is available around 30 mph in high gear. The car will almost certainly give the best gas mileage of the group at normal-service speeds, and contains the fewest questionable design features.

### BUYING A CAR

Ordinarily, no car should be purchased without a demonstration that is satisfactory to all driver members of the family. "Putting the car through its paces," however, is not as important as driving over familiar roads at the driving speeds you habitually use. Before you make this test, which should be duplicated with each car you try, list the features that you expect to obtain or avoid.

There is another element in car selection that cannot be covered by statistics. If you roll your car 50,000 miles, for example, you will spend approximately 2000 working hours behind the wheel, often under arduous conditions. How good is the driver's vision? How handy are the controls? How comfortable is the seat, and how easy to adjust, etc.? Even the *feeling* of roominess and comfort is important. The performance of the engine is important, but your own performance will depend on how the car fits you.



THE 1946 CHEVROLET, rated by CU's consultant as the all-round "Best Buy" among the automotive "Big Three."

# Selecting a New Car

1. Is 1946 a good year to buy a car? Yes, if you need one and are willing to sacrifice the utmost in operating economy. It is expected that in 1947 there will be more cars matching *Studebaker Champion*, *Nash 600* or *Willys* in economy. Otherwise, 1946 cars, if they suit you, will be good buys because most of them are really well-seasoned 1942 models, modified only in minor details.

2. Is the experience of friends with their cars a good guide for me? Not particularly. Unless your friends treat their cars just about as you do, drive about the same mileage yearly in trips about the same length you make, their results will be different from yours. A few opinions do not make a very accurate "sampling." But their experiences—particularly any bad experiences—will be instructive in a general way, and you should find out what luck they had.

3. Why can't I simply rely on CU's ratings, and pick out a "Best Buy"? You can. But CU ratings, unless comments indicate otherwise, are made with the "average" car owner in mind. (Briefly, he is a motorist who drives not over 10,000 miles yearly, mostly in trips of under 30 miles, and expects to keep his car four or five years, at least.) CU will always try to give enough information about each car so that, if you don't fit the average category, you can modify our quality ratings in the light of your own special requirements. But besides quality, there are other factors to be considered. You should make your decision on a combination of CU's ratings and your own personal requirements.

4. Does paying a higher price insure my getting a better car? If by a better car you mean one that will give you more miles per dollar expended, the answer is *No*. However, details of equipment and finish are apt to be of better quality as you pay more. The higher-priced car will generally be more comfortable, but be harder to park and more expensive to repair. Depreciation will be higher



## CU answers typical car-buyers' questions

on a more expensive car, so that you will lose more money when you sell it. It will usually have slightly more power and speed than a cheaper car, will use more gas and will last a bit longer. But it will not be more reliable or trouble-free than the lower-priced cars.

**5. Are all the engineering features I see advertised desirable? How can I choose between them?** Don't bother to try; most of the so-called engineering achievements don't mean much anyway. Some are not really improvements, but rather corrections of previous weak points. Many "features" have serious drawbacks that aren't mentioned in the ads. For example, Buick's wide-base rims, which increase stability, also make the car ride harder. Few engineering features are used for reasons that can be explained in advertising. What counts in a car is not "features" but results.

**6. Isn't it safest to buy from one of the "big three" manufacturers, who will stay in business? Ford, GM and Chrysler have the greatest resources, it is true. But right now, the "independent" manufacturers are financially stronger than ever, as a result of their war work. It is extremely unlikely that they will be forced out of business during the lifetime of the car you buy, in the present sellers' market. If it is the effect of an "orphaned" brand-name you have in mind, do not forget that it was GM who once made the Viking, the Marquette, the LaSalle and the Oakland.**

**7. With their resources, don't the "big three" build the best cars?** Resources cannot substitute for engineering (or vice versa). Some of the industry's best engineers, some of the best engineering detail, and some of the best cars are from the "independent" companies.

**8. After all, aren't they all pretty good cars? Why should I be fussy?** It's true that they are all pretty good, but some are likely to be much better than others for your own particular needs. You will have more pleasure and less expense if you pick the best car for your uses—the car that suits you best.

**9. Why not buy where I get the best trade-in allowance for my old car?** The chances are that the car which suits you best won't be the one against which you get the highest trade-in allowance. If it is, so much the better. But if you plan to keep your next car for four or five years, a \$50 or \$75 over-allowance now will probably look mighty small to you in 1950, especially alongside a stack of repair bills. Better buy the car, not the "bargain."

**10. Should I select a make of car that will have a good trade-in value?** By all means, though you can only speculate at this time on what future trade-in values will be. If you keep a car for four years or more, the difference between high and low trade-in values will have become very small, in dollars. Unless you are a two-year trader, to whom good trade-in value is a major asset, it is wiser to buy the car your judgment says is best. If you are right, it will have good trade-in value, anyway.

**11. If I plan to trade again in a year or two, how should I buy?** In this case, face the fact that you are a trader, and are not necessarily looking for maximum transportation value. What you want is the car that will be most sought after a year or two from now, and hence will command the best price. CU's guess is no better than yours, though the car will probably be one of the standard makes—say, Plymouth, Pontiac or possibly (and sight unseen) the 1947 Studebaker Champion.

**12. How about going around to the showrooms and making my decision right on the spot?** Don't do it that way. The showroom is the worst possible place to make up your mind. Decide at a time when you are not subjected to selling pressure, and after you have had a chance to compare notes, mental or otherwise. Decide at home, or on the way back from a road test.

**13. Is it necessary to take a demonstration ride in each car I look at?** No, but you should certainly ride in and, if you can, drive two or three cars—including the make you finally buy—to get standards for judging. The car you buy should satisfy all the drivers in your family, as well as those who will ride in the back seat. Don't test for top speed or do stunts. Drive each car over the same road in much the same way. Easy riding;

easy steering; good control on rough roads, on turns and in parking; good vision; quiet performance; solidity of structure; sureness of braking—these are the things to look for.

**14. Is the horsepower of a car a good guide to value?** No. Usually a car with more horsepower will cost more to operate and will go faster than a less powerful car. Beyond this, horsepower—or horsepower per pound of weight, for that matter—has little practical significance.

**15. Isn't it worth a little more to get a heavier car in which I will feel safer?** You will be safest in a car which is strong rather than heavy, from which the driver can best see what he has to avoid, which is easily and quickly maneuverable, and which is painted a light color, making it stand out in the vision of other drivers. How much the car weighs is of secondary importance.

**16. Doesn't a heavy car hold the road better?** Other things being equal, yes. But the way a car is designed, its springs and its balance have at least as much to do with holding the road as its weight. The light Studebaker Champion, for instance, holds the road very well at comparatively high speeds, in the opinion of many expert drivers. If you want to know whether a car holds the road well, don't weigh it, drive it!

**17. Do I need to make a gas mileage test of the cars I'm interested in?** No. You can't make any brief test that will tell you what the car's overall mileage per gallon will be. You can get a rough comparison between cars by multiplying the piston displacement of each by its rear axle ratio. The smaller the product of these two, the better the gas mileage is likely to be; no car can depart far from this basic factor.

**18. What are a few important and easy-to-remember things to check on as I buy?** Assuming that you will utilize CU's statistical tables in making your choice, here are six other features to investigate:

(1) If folks will use the rear seat a lot, measure the width of it at hip level. Even small differences here are important for comfort.

(2) The most generally comfortable seat height is 15 inches. Seats much lower will cramp you on long trips. Measure.

(3) Compare the accessibility of

(a) the ignition distributor, (b) the fuel pump filter bowl, (c) petcocks for draining the cooling system, (d) the fuses you may have to replace in the dark some Winter night.

(4) Ask to see the jack and how it is placed and used.

(5) Compare engine noise and vibration while driving at a steady 40 mph in second gear.

(6) Commence a number of accelerations by pushing down varying amounts on the treadle, then releasing it again; what you are to compare is the *promptness* and *certainty of response* of the cars, not how rapidly they accelerate once they get going.

**19. Are optional economy rear axle ratios worth specifying—and waiting for?** Decidedly, if you plan to drive your new car over 25,000 miles and are willing to accept a slight reduction in high-gear acceleration and hill climbing. You will gain longer engine life, better mileage on gas and oil, and a quieter ride. The optional economy ratios are probably not a good idea if you live in mountainous country or always drive a fully-loaded car.

**20. Is a fourth speed or overdrive worth the extra cost?** Yes, for the reasons given above. These units, however, give you standard or better acceleration, in addition to the economical fourth speed. Most of them lessen or abolish clutch-pushing and gear-shifting.

**21. In choosing my car, how much weight should I give to the availability of repair service?** If you plan to patronize your new-car dealer for service, this factor should have considerable weight. Investigate his repair shop, inquire about it among your friends. If you plan to travel a great deal, country-wide service facilities are an obvious asset.

**22. Are de luxe models better buys than the standard (or lower-priced) models?** Not unless you get something for your money besides extra chrome strips and two sets of arm rests, visors, etc., instead of one. Worthwhile features would include more adequate tires, better upholstery springs and padding, more plate (instead of sheet) glass, or other items having value in use, not in looks.

**23. Are some body types better values than others in the same line of cars?** Yes, provided they fit your uses. Two-door sedans are usually priced

much closer to actual cost than are four-doors, and they are quite as satisfactory for most drivers. If you need only three-passenger capacity, business coupes are very good buys. (The *Dodge* business coupe, for example, costs less than a *Plymouth* sedan.) Convertibles, on the other hand, often cost as much as solid-top models in the next-higher-priced line, besides lacking safety if upset. Avoid the conventional station wagon, which has high first cost and high maintenance, unless you are positive that nothing else will do.

**24. What is the best way to pay for my new car?** Pay cash if you can. If

you borrow, you can do so to best advantage through a collateral loan at your bank, or through a Credit Union loan. If you finance your purchase—buy on “time” and sign an installment sales contract—your money will probably cost least if a bank (rather than a finance company or self-financing dealer) issues the contract. Simple interest on your borrowings should not run over 12% calculated on the unpaid balance of the car’s price (not including insurance premium). If it does, investigate the finance charge, of which the dealer gets a cut, and which is the item through which the borrower is most usually fleeced.

## Pressure Cookers

More brands are on the market now, but CU found only one real improvement among postwar cookers

Many new pressure cookers have appeared in the postwar market, but they are pretty much like the prewar product, CU’s laboratory tests of ten pressure cookers show. The only new feature of any significance is the variable pressure gauge on some of the cookers.

When you see the department store demonstrator blithely open and close a (cold) pressure cooker with a flick of her wrist, keep in mind that there’s a serious possibility that her smile of accomplishment might turn to a cry of pain if she were doing the same thing when the cooker was hot from use. For three of the ten brands of pressure cookers tested by CU involved definite burn or scald hazards, and were rated “Not Acceptable” partly on that account. A fourth cooker received a “Not Acceptable” rating because its safety valve did not function at a safe maximum pressure.

And while you’re in a skeptical mood, better take with a grain of salt claims such as those made in the *Wear-Ever* advertisement, which says: “See how kitchen hours melt to minutes, when the fast *Wear-Ever* Pressure Cooker reaches temperature: Potatoes—8 minutes, Broccoli—1½ minutes, etc.” It’s quite true that the actual pressure-cooking time is reduced to a fraction of normal through the use of a pressure cooker. But when you’re adding up the minutes, don’t neglect to include the time

it takes for the cooker to reach the required pressure, nor the additional minutes (with some foods) for the pressure to drop back to normal after the pot has been taken off the heat, and before you can remove the cover.

Most housewives who have used pressure cookers over a period of years are agreed that they have a place—and a very useful one—in the kitchen. At the same time experience has taught them that the pressure cooker isn’t anything like the universal panacea for kitchen troubles the advertisers are likely to claim.

By and large, a pressure cooker is useful for:

- Cutting down cooking time on long-cooking vegetables, fruits, cereals and meats.

- Reducing cooking odors in the kitchen, in the preparation of such foods as cabbage, cauliflower, etc.

- Preserving a maximum of the flavor (and incidentally, the vitamin content) of certain vegetables.

But a pressure cooker is not much good when it comes to:

- Cooking fruits and vegetables that normally require a relatively short cooking time. (For example, many frozen vegetables are likely to be overdone in a pressure cooker, no matter how little time is given.)

- Preparing vegetables which are rather variable in their cooking time requirements. (For example, fresh, young peas require much less cooking than older, tougher ones; with a



pressure cooker, you must guess the time the particular batch you are cooking will require.)

- Preparing dishes that require seasoning or other manipulation in the course of cooking. (Bringing up the pressure and letting it fall several times in the course of cooking is a nuisance, and is likely to take as much time and trouble as ordinary cooking.)

- Cooking foods that tend to froth. (The froth, plus small amounts of the food carried along with it, may stuff up the valve.)

- Duplicating any operation other than boiling or steaming. (Sauteing, roasting, frying, etc. are out.)

- Cooking small amounts of food. (The four-quart pressure cooker is a nuisance to handle and to wash if all you want to cook is a cupful of peas.)

Convenience and safety, two of the most important points to look for when you buy a pressure cooker, depend greatly on the type of cover and the sealing device used. A pressure cooker becomes extremely hot during cooking, and a good deal of scalding steam is released when the cover is being removed. So that your hands will be away from the pot opening and out of contact with hot metal, a cooker should have long handles and the simplest possible sealing device. Among ten brands tested by CU, three brands were found "Not Acceptable," chiefly because of complicated and inconvenient methods of sealing the covers.

The best and simplest device for sealing the cover found among the cookers tested was the slip clamp seal, consisting of a ring of clamps or "teeth" around the edge of the



ONE OF THE BEST pressure gauges tested was this variable type on Sears' *Maid of Honor* cooker. Cooking heat had to be adjusted to maintain the desired pressure.

cover. These clamps slide under corresponding clamps on the outer rim of the pot. The seal is effected simply by placing the cover on the pot, holding onto the pot handle with one hand, and turning the cover handle with the other hand until it is directly above the pot handle. The *Mirro-Matic*, Sears' *Maid of Honor*, the *Presto* and the *Time-Saver* all had this type of seal, with pot and cover handles long enough for safety and convenience. Montgomery Ward's *Magic Seal* also had a slip clamp seal, but it was fitted with pairs of handles so short that there was danger of touching hot metal while manipulating the cover.

CU technicians considered the lever-type seal, used on the *Wear-Ever* and the *Universal*, relatively inconvenient. However, housewives who have used the *Wear-Ever* cooker for years report that they had no trouble with it once they got used to it. To effect a seal on such a cooker, the cover is placed inside the pot opening, and then forced against the opening by squeezing the pot and handle covers together and locking into place. The *Pressur-Seal* and *Ekco*, both "Not Acceptable," had covers which fit inside the pot opening and had to be manipulated with the hand directly over the pot opening and close to hot metal, resulting in a scald hazard, as well as a burn hazard. The other "Not Acceptable" cooker, the *Merit*, was sealed by four screw clamps, a burn hazard since the clamps became hot and fell out if they were loosened too far when the cover was being removed.

One postwar development found in some of the pressure cookers is a variable type of gauge that permits cooking at pressures lower than the usual 15 pounds. This allows for better control of cooking time on foods that require short cooking periods. Furthermore, some meats are tastier if cooked at low pressures.

The *Mirro-Matic* and the *Maid of Honor* were among the cookers with variable pressure gauges. The *Mirro-Matic* gauge was the easiest to use and as durable as any gauge tested. It could be placed on the pressure vent in one of three positions for 5, 10 or 15 pounds pressure; it was accurate; it had no moving parts which could get out of order; and it maintained the desired pressure, no matter how much heat was applied. The *Maid of Honor* pressure gauge had a dial marked in one-pound gradations. This gauge registered



CONSIDERED BEST of all gauges tested, the *Mirro-Matic* gauge could be placed on the vent in any one of three positions, for 5, 10 or 15 pounds pressure.

pressures accurately, but the heat had to be adjusted to maintain the desired pressure. Like many of the gauges tested, the *Maid of Honor* gauge had to be handled with care because dropping or rough use might affect its accuracy.

CU's tests of pressure cookers were designed in part to simulate use in the home, and to expose any possible breakdown during repeated normal use. Convenience and safety under both normal and adverse conditions were noted.

To determine its safety, each cooker was tested for performance of the safety valve, burn and scald hazards in normal use, and effectiveness of insulation on any parts that were normally handled. On only one cooker, the *Time-Saver*, did the safety valve permit the pressure to rise excessively.

In the tests of performance, the pressure gauges were studied for accuracy, durability, ease in handling, gradations of cooking pressure, and presence of defects which might allow the pressure to rise excessively with no warning to the user. The ease of removing and replacing the cover was given a great deal of consideration in the performance tests. The capacity of the cooker was noted, and consideration was given to the amount of water which would evaporate in 20 minutes of normal pressure cooking. It was also noted that no platform had been provided for raising the food from the bottom of the pot on three of the cookers.

Durability and ease of maintenance



**REMOVING THE COVER** was a simple and safe operation when the pressure cooker had a slip clamp seal, such as that of the Mirro-Matic, above. *CU* rated the Mirro-Matic highest on all-round quality.

were determined by checking the ease of replacing worn gaskets and broken handles, ease of cleaning, construction of parts, and possible corrosion in normal use. None of the cookers was found likely to corrode.

A good pressure cooker is safe to use if you exercise reasonable care. You shouldn't start it and then make a phone call or leave the house.

Manufacturers' instructions—especially those which tell you how to clean the pot and cover—should be carefully observed. Before each use, be sure to examine the vent over which the gauge fits by holding it up to the light to make sure it is clean. A stuffed vent can cause the safety valve to blow out.

It is a good idea to send to the manufacturer for a spare safety valve as soon as you buy your cooker. Extra ones are not likely to be available in the stores, and delivery from the factory takes time.

#### ACCEPTABLE

(In estimated order of quality)

**Mirro-Matic** (Aluminum Goods Mfg. Co., Manitowoc, Wis.). \$12.95. Capacity 4 qt. Seal effected by slip clamps. Convenient pressure gauge consisting of round metal weight which could be placed over vent in three different positions, for 5, 10 or 15-lb. cooking pressure. Gauge simple, with no moving parts to get out of order. With vent closed, safety valve blew at 20 to 24 lb. This is close to cooking pressure, but regulating gauge would not normally allow cooking pressure to rise above 15 lb. Fairly high water evaporation rate. Handles and gasket easily replaceable. First cover tested had breakable handle, which was im-

possible to replace because of inadequate threading in handle screw and pot casting. This fault had been corrected in second sample purchased.

**Maid of Honor** Cat. No.—4682 (Sears, Roebuck). \$10.95 plus postage. Capacity 4 qt. Seal effected by slip clamps. Pressure gauge accurate, marked in 1-lb. gradations up to 19 lb. Gauge so weighted as to allow escape of sufficient steam to keep cooking pressure constant at about 17 lb., even with excess heat. Heat had to be regulated for desired pressure. Care required in handling gauge, as rough use or dropping might affect accuracy. With vent closed, safety valve blew at 42 lb. High water evaporation rate. Gasket and handles easily replaceable.

**Presto** (National Pressure Cooker Co., Eau Claire, Wis.). \$12.50 in cast aluminum, \$12.95 in pressed aluminum. Capacity 4 qt. Seal effected by slip clamps. Pressure gauge had one cooking pressure, set for 15 lb., and marked "Cook." Heat had to be regulated to keep pressure at that point. Excessive heat caused pressure to rise to 19 lb. before weight of gauge allowed steam to escape. Care required in handling gauge, as rough use or dropping might affect its accuracy. Of two similar gauges tested, one was accurate and one was not. With vent closed, safety valve blew at 45 lb. High water evaporation rate. Handles and gasket easily replaceable. Pressed aluminum cooker had cover difficult to clean.

*The following were not as convenient to use as the three cookers above:*

**Magic Seal** Cat. No.—6832L (Montgomery Ward). \$10.50. Capacity 4 qt. Seal effected by slip clamps, engaged by turning two cover handles so that they fitted over two handles on pot.

Handles were too short and got hot during use; opening and closing of cover had to be done carefully to avoid touching hot metal. Gauge consisted of weight with rising pressure indicator; red mark on indicator showed when cooking pressure had reached 15 lb. Heat had to be regulated to keep pressure at that point. Care required in handling gauge, as rough use or dropping might affect its accuracy. With vent closed, safety valve blew at 48 lb. Low water evaporation rate. Handles and gasket easily replaceable.

**Wear-Ever** (Aluminum Cooking Utensil Co., New Kensington, Penna.). \$13.95. Capacity 4 qt. Curved steel spring-action cover fitting inside pot. Seal effected by squeezing handles together to flatten cover against overhang of pot. Pressure gauge was weight which allowed escape of sufficient steam to maintain cooking pressure at 15 lb., even with excess heat. With vent closed, safety valve blew at 33 lb. Low water evaporation rate. Pot handle impossible to replace, cover handle easy to replace, gasket difficult to replace. No rack provided.

**Universal** (Landers, Frary & Clark, New Britain, Conn.). \$11.95. Capacity 4 qt. Oval cover fitting inside oval pot opening. Seal effected by squeezing handles together to press cover against overhang of pot. Pressure gauge was weight which allowed escape of sufficient steam to maintain cooking pressure constant at 15 lb.—providing heat was lowered when pressure reached this point. Excessive heat lifted gauge rapidly and kept it up until enough steam escaped to lower pressure to 8 lb. before gauge dropped. With vent closed, safety valve blew at 42 lb. Low water evaporation rate. Pot handle easy to replace, cover handle breakable and impossible to replace, gasket difficult to replace.

#### NOT ACCEPTABLE

*The following brands were judged "Not Acceptable" for the reasons stated:*

**Time-Saver** (Traubee Products Inc., Brooklyn, N. Y.). \$13.95. Capacity 4 qt. Seal effected by slip clamps. Pressure gauge consisted of metal weight with two removable slip rings which enabled adjustment to 5, 10 or 15 lb. cooking pressure. Gauge and rings were difficult to handle because they got very hot, and no provisions were made for removing them with ordinary kitchen utensils. Heat had to be adjusted to maintain pressure with minimum evaporation of water, although excess heat did not cause pressure to rise. With vent closed, safety valve allowed pressure to rise to 55 lb. without blowing. This was considered too high for safety. Low water evaporation rate. Handles and gasket



were easily replaceable, but gasket tested was poorly made and did not fit well.

**Pressur-Seal** (Aluminum Products Co., La Grange, Ill.). \$11.95. Capacity 7 pt. (marked 4 qt.). Removal and replacement of oval cover required difficult manipulation; cam arrangement raised cover which fit into pot against overhang of pot. Cover had 1¾-in. short wooden handle of which only ¾ in. was usable, since the rest became hot during use—a burn hazard. Manipulation required to take cover out of pot presented scald hazard. It was found impossible to tighten cover without holding the two cover hooks in place. If pot was hot, these were impossible to hold without a pot-holder. Gauge was weight to keep pressure constant. No food platform provided.

**Merit** (Merit Machine & Metal Works, Brooklyn, N. Y.). \$12.95. Capacity 4 qt. Non-removable pressure gauge marked in 5-lb. gradations up to 20 lb. Since gauge was not removable, it was impossible to clean cover without getting water into gauge unless vent was plugged, and this was very difficult. Seal effected by four screw clamps similar to old-style canning pressure cookers except that, in the *Merit*, they were not connected and fell off the cover if unscrewed too far. These screws got hot during cooking, and picking them up presented burn hazard. Plastic wing nuts used to tighten the clamps broke when dropped. Pressure was adjusted by adjusting heat. There was a ball valve over a vent, also supposed to adjust pressure. Casting of pot was poorest among all cookers tested. A black smudge over the inside came off on the hands regardless of repeated washings of pot.

**Ekco** (Ekco Products Co., Chicago). \$13.95. Capacity 4 qt. Cover fit into pot and spring action forced cover against overhang of pot. Sliding rod fit into hole of handle and kept cover closed. To remove cover, it was necessary to depress large plastic knob on cover. Screw set into this knob became hot during use and presented burn hazard. Manipulation necessary to remove cover kept hands close enough to pot opening to present scald hazard. Handles on pot were 1½ in. wide and were set into sides of pot with two screws each. These screws became hot and it was almost impossible to lift pot without touching screws—another burn hazard. Screws were made of steel and set into the soft aluminum pot. The threads were easily stripped, and once gone, handles could not be replaced. Pressure gauge was so set that when water was run over cover, according to directions, some of this water entered pot. Pressure gauge operated against spring, and required high heat to keep at 12¾ lb. maximum pressure.

*In CU's tests of 13 brands, the Hoover 27, shown here, had the highest rate of dirt-removal among all the cleaners, and was judged a "Best Buy" upright model.*

Very few improvements over prewar models were found in tests of 13 brands of vacuum cleaners just completed in CU's laboratories. Outside of two new gadgets—one practical, and the other practically useless—most of the changes were in the styling and the materials used. No changes were noted which would be likely to affect the durability or the cleaning quality of the machines.

The highest quality cleaner tested, and the "Best Buy" among the seven upright (handle-type) models, was the *Hoover 27*, priced at \$57.50; the *Electrolux*, costing \$69.75, proved to be the highest quality of the tank-type cleaners. Despite the fact that it was the most expensive cleaner tested, it was judged one of the "Best Buys" in the tank class because of its comparatively high rate of dirt removal and other desirable qualities. Montgomery Ward's *All-Purpose*, although it was only fourth in cleaning ability among tank cleaners, was also judged a "Best Buy" at the price—\$39.95 plus postage—which made it the least expensive of all the cleaners tested.

Ward's *All-Purpose* was, in fact, found to be practically identical in construction and performance to the \$66.50 *Eureka* tank, except for the finish on the body and somewhat

lower quality cleaning tools. And the *Royalair*, second in quality among the tank-type cleaners, was substantially the same as the *Royal*, except that the *Royal* had a better-looking body finish, a differently-shaped wand, and two extra attachments, not furnished with the *Royalair*. The *Royal* cost \$60; the *Royalair*, \$49.95.

Many brands and models listed in CU's last report on vacuum cleaners in November 1941, including the four then judged "Best Buys," were not available in time for the current test. New models are constantly making their appearance in the stores, however, and these will be tested as soon as they are available, and rated in forthcoming issues of the *Reports*. Prices of cleaners have changed somewhat since before the war, but no consistent trend either up or down was noted.

Performance, durability, convenience, economy and safety were the general qualities CU technicians checked in their tests of the cleaners. The machines differed greatly in rate of dirt removal. Tests for dirt removal were made by a new method, originated in the CU laboratories, in which the cleaner being tested, and another cleaner used as a standard, are run alternately over a naturally-dirtied rug area. (A fuller account of this test method can be found in

## VACUUM CLEANERS



the October 1945 *Consumer Reports*.)

#### DIRT REMOVAL

Among upright cleaners, the *Hoover* rated almost twice as high in rate of dirt removal as the machine next best in this respect—the *General Electric DeLuxe*. This means that to get the same amount of dirt out of a rug, it would be necessary to use the *GE* about twice as long as the *Hoover*. The *General Electric*, together with the upright *Eureka DeLuxe* and the *Cadillac*, were rated as fairly good in dirt removal rate; *Sears' Kenmore Electromatic Imperial* and the *Premier 21* were next with medium rates of dirt removal; the *Royal 215* was the poorest in this respect.

Among tank-type cleaners, the *Electrolux* had the highest dirt-removal rating, even though it was only about as fast as the upright *Royal*, and only about one-quarter as fast as the *Hoover* in removing dirt from a rug. The *Royalaire* and *Royal* tanks were next, with what was considered a fairly high rate for tank cleaners, followed by *Ward's All-Purpose* and *Eureka* which rated medium and the *Universal*, which had the lowest dirt-removal rate of all the cleaners tested.

#### UPRIGHT VS. TANK

But, though tank-type cleaners are slower than uprights in removing dirt from rugs, there are other factors to be considered before you make a decision as to which type you want to buy. Most important is the question of what kind of cleaning you want your vacuum cleaner to do. If you are chiefly interested in cleaning rugs, an upright with a revolving brush will probably be the best

choice, for a good upright will do an equally good job on rugs much faster, or a better job in the same time as the best tank cleaner. But if you want a convenient cleaner for all around work, including the cleaning of draperies, upholstered furniture, floors, woodwork, radiators and walls, a tank-type cleaner is likely to be a better choice.

The two types of cleaners use different principles in cleaning rugs. The tank type relies wholly on suction, with a more or less effective seal being made between the nozzle and the surface being cleaned. In the upright sweeper, a rotating brush loosens the dirt by agitating the rug fibers, and the loose dirt is sucked up in a stream of air which passes through the nozzle of the cleaner.

#### RUG CLEANING

In uprights, any lint is loosened from the rug by the brush action, and it is either sucked into the bag along with the dust, or is caught on the brush from which it must eventually be removed. With tanks, however, any lint which adheres to the rug too firmly to be removed by suction alone must be taken off by an attachment on the rug-cleaning nozzle. On most tank cleaners, this device is a simple stationary brush, which loosens the lint. The *Electrolux* has no brush; instead, the user picks up lint by flipping over the rug-cleaning nozzle on a swivel-head, and picking up each bit of lint through a small strong-suction opening on the nozzle's reverse. This can be something of a nuisance if the rug is very linty. In general, *CU's* tests showed that the tank-type cleaners compared favorably with uprights in lint removal.

The rotating brushes do have some

slight wearing effect on rugs, but this is insignificant compared with the ordinary wear-and-tear rugs get in use. You should not, however, allow an upright cleaner to stand on one spot on the rug, with the motor running. For cleaning expensive Oriental rugs—the kind that you expect to last from generation to generation—it may be best to use a cleaner with no brush. All the uprights had rotating brushes; among tanks, the *Electrolux* rug cleaner had no brush; on the *Royal* and the *Royalaire* tanks, the brushes could be raised above rug level.

#### ATTACHMENTS

The special advantage of the tanks in cleaning walls, draperies, moldings, upholstery, bare floors and other surfaces which require special attachments, lies in the ease with which such tools can be attached. Most uprights are a real nuisance when it comes to the use of attachments, since they require that the belt, which rotates the brush, be disconnected from the motor shaft before the attachments can be coupled. This is generally done by removing the plate from the front of the cleaner, then reaching inside the small opening and pulling off the belt. Even more difficult is the replacement of the belt after the cleaning tool is removed. Fingernails can be easily broken and tempers frayed in the process. As a result, many housewives who buy cleaning accessories for an upright cleaner find that attaching them is such a task that the tools are eventually left in a closet to collect dust instead of removing it.

The *Hoover*, the *Kenmore* and the *Eureka* partially overcome this difficulty by providing for the attachment of the cleaning tools without manual removal of the belt, but even so, the upright cleaners with tools attached are rather ungainly and hard to get around to the places where they are needed. Furthermore, even after the tools are attached and the cleaner set in place, the tools of an upright are less efficient than those of a tank cleaner. This is because the tanks, which rely entirely upon the sucking action for their cleaning, need a much stronger suction than do uprights.

Tools for most of the upright cleaners are sold as "extras," not included in the price of the machine.



THE HIGHEST RATE of dirt-removal for tank cleaners was shown by the *Electrolux*. This machine was judged as the best of the tank-type models.



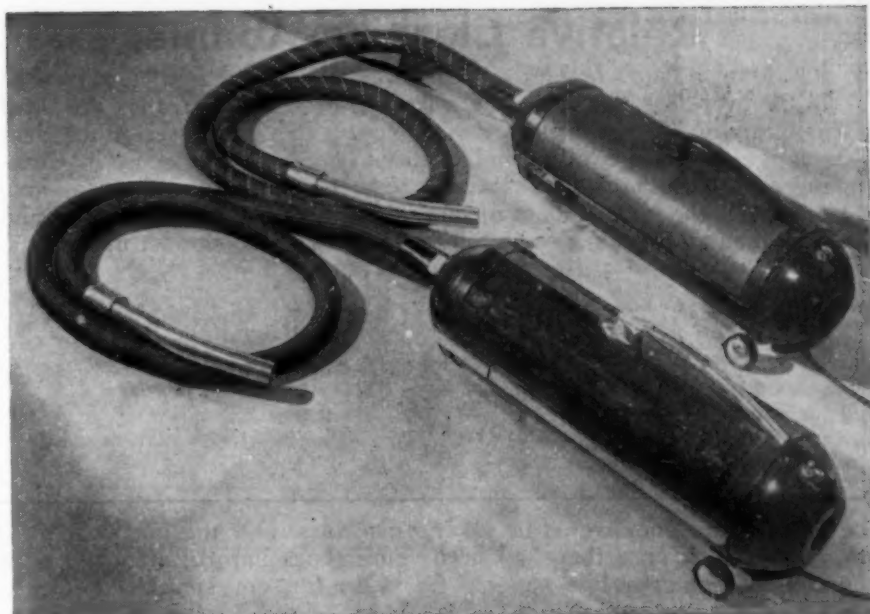
Moreover, in most cases the tools were not available at the time of test, even at the extra price. With the current high demand for cleaners, manufacturers appear to be concentrating on the production of the cleaners themselves, before they begin turning out the tools to go with them. CU was able to buy no attachments for the *Hoover*, the *Premier*, the *General Electric* or the *Kenmore* uprights. Attachments were sold with the *Cadillac*, however, and were included in its list price.

#### TIE-IN SPECIAL

The attachment situation on the *Eureka DeLuxe* was rather unique. Eureka makes two models: upright and tank, and the cleaning accessories for them are interchangeable provided you couple them into the upright cleaner with a belt-removing gadget, the *Attach-O-Matic*, priced at \$3.50. The rub is that though you can buy the *Attach-O-Matic*, you can't buy the tools to couple into it. You can't, that is, unless you buy the *Eureka* tank cleaner, which comes complete with tools that also fit the upright. The manufacturers were making a neat thing of this situation by selling one upright *Eureka*, one tank *Eureka*, one set of tools and one *Attach-O-Matic* as a "package," all for \$144. OPA ruled, however, that the practice constituted a tie-in sale, and Eureka now sells its tank cleaner with attachments for \$66.50 and its *Eureka DeLuxe* upright for \$76.

The *Attach-O-Matic*, incidentally, was one of the two new gadgets CU technicians found on this year's models. It was judged quite useful, in that it performed simply and automatically the otherwise difficult job of removing and replacing the belt before and after attachment of cleaning tools. The other novelty was the "signal light" on the *Universal*, supposed to indicate when the dust bag is full. But this signal was found to be little more than a talking point, for the bag had to be considerably overloaded before the light would function.

Insertion of cleaning tools on the *Hoover* was accomplished easily enough through a slot in the side of the head. When a tool is inserted into the slot, the brush of the machine is raised off the rug, and the suction is made to by-pass the brush area. In the *Kenmore*—the only other upright not requiring manual removal of the belt for tool attachment—the device



SISTERS UNDER THE SKIN. The *Eureka*, in the foreground, had a different finish from Ward's *All-Purpose*, rear, but the two cleaners were similar in construction and quality. The *Eureka* cost \$66.50 and the *All-Purpose*, \$39.95.

for fitting the tools is fitted over the entire front of the cleaner, and all of the dirt collected by the tools must pass through the revolving brush, where much of it is caught before it reaches the bag. This was not considered desirable by CU technicians.

#### NAP ADJUSTMENT

Nap adjustment enables the user to regulate the space between the nozzle and the rug to allow for the depth of rug pile. If the rug has a deep pile, for example, the nap adjustment should be set high, in order to save wear on the rug. Too high a pile setting on a thin rug means poor cleaning. With the exception of the *Kenmore*, all the uprights had satisfactory nap-adjustment devices. The nap adjustments on the *Hoover*, the *Premier* and the *Eureka* had only two positions—low and high. The *General Electric*, the *Royal* and the *Cadillac* had variable adjustments which could be set at any point in between as well. A two-position adjustment would appear adequate.

The *Kenmore's* "automatic" nap adjustment consisted of nothing more than a pair of relatively large wheels, set midway between the back and front pairs. In theory, a high nap would tip the cleaner backward over the center wheels, raising the nozzle; a low nap would tip it forward, bringing the nozzle lower. But this simple technique did not work in

practice. Actually, the height of the nozzle above the rug depended at least as much on the pressure being applied by the user to the front or back of the cleaner (and this would vary considerably within each sweeping stroke) as on the height of the rug's nap.

All the upright cleaners had three-position handles: an upright position for storage; a middle position, in which the cleaner could be swung in a wide arc, for normal cleaning; and a "down" position, which kept the handle almost parallel with the floor, for cleaning under low furniture.

Maneuverability, which determines how much effort it takes to move the nozzle over the rug, varied among the uprights from "easy" for the *Hoover* and the *Kenmore* to "difficult" for the *Royal* and the *Cadillac*. The tanks were all quite easy to get from place to place; most of them moved on gliders, some had a combination of gliders and wheels. But the designs of the cleaner nozzles on some brands interfered with free and easy movement.

Four of the upright cleaners—*Eureka DeLuxe*, *Premier*, *General Electric* and *Cadillac*—could be operated at two different speeds. But CU technicians could find no real advantage in the second, slower speed. Headlights were featured on all the upright cleaners, but most of them were built so that replacement would

## Relative Cleaning Abilities

Many factors besides dirt removal were taken into consideration in the over-all ratings. In the following lists, however, they are rated in terms of *dirt removal only*, with figures in parentheses giving their relative positions in all-round quality. The *Electrolux*, best in cleaning among the tank-type cleaners, required about four times as long to remove the same amount of dirt as the *Hoover*, the best upright, and it cleaned at about the same rate as the *Royal*, the slowest upright.

Upright	Tank
<i>Hoover</i> (1)	<i>Electrolux</i> (1)
<i>General Electric</i> (5)	<i>Royal</i> (2)
<i>Eureka DeLuxe</i> (3)	<i>Royal</i> (3)
<i>Cadillac</i> (7)	<i>Ward's All-Purpose</i> (4)
<i>Kenmore</i> (2)	<i>Eureka</i> (5)
<i>Premier</i> (4)	<i>Universal</i> (6)
<i>Royal 215</i> (6)	

be difficult, and they would be likely to remain dark once they had been burned out—no great loss.

Weight variations from 11¾ pounds (for the *Royal* upright) to 15¾ pounds (for the *Cadillac*) were found. In the cleaning operation, weight would be a secondary consideration, with maneuverability a much more important point. But a heavy cleaner can be a real burden if you live in a two-story house, and have to carry it up and down the stairs.

There were major differences in power consumption among the different brands. In uprights, the range was from 270 to 390 watts; tanks ranged from 460 to 525 watts. Power consumption would appear to have much more effect on the electric bill than on the relative cleaning ability of the different machines, for the best-cleaning machine—the *Hoover*—also had the lowest power consumption. The difference in power level between the uprights and the tanks can be accounted for by the fact that the tanks need stronger motors to generate the greater suction they need.

The amount of noise produced by the cleaners was measured in the CU laboratories by means of a decibel-meter. Translated into consumer terms, the loudest cleaner would sound about three times as noisy as the quietest. Upright cleaner noise varied from medium to loud; tank cleaners were quiet to medium.

On the tank cleaners, some of the switches were foot-operated, others had to be operated by hand. The foot switch would be a convenience factor if bending is burdensome.

"Dielectric strength" was measured on all the cleaners, to determine the effectiveness of the insulation in the

machines, and the likelihood of future shock hazard, after it has been in use for some time.

Over-all scores, based on the tests outlined above, showed that among tank-type cleaners, the final standing was in the same relative order as the cleaners' dirt removal rates. Among uprights, however, differences in factors other than dirt removal resulted in a reshuffling of some positions. (See chart above.)

### CLEANER CARE

Whatever vacuum cleaner you have, the life of the machine and the quality of the service you get from it will depend a good deal on the care that you give it. The dustbag should be emptied frequently. An accumulation of dirt in the bag increases the back-pressure, with consequent reduction of the suction.

If you use a tank-type cleaner, examine the filter occasionally. A dirty filter cuts down efficiency. When the filter gets dirty, it should be cleaned or, if necessary, replaced.

Read carefully the instructions that come with your machine. Oiling instructions should be carefully observed.

The rotating brushes on upright cleaners work best when they extend about ¼ inch beyond the nozzle. You can check this by turning the sweeper over and holding a card across the nozzle. The height of the brush should be readjusted as it wears down, where this is possible, as on the *Kenmore* and the *Premier*. On the *Hoover*, the brush can be replaced as a separate unit, but on all the other cleaners tested, it would be necessary to replace the entire rotor unit to attach a new brush.

Watch the condition of the electric cord on your cleaner. As on all electric equipment, a worn cord on an electric cleaner represents a serious fire and shock hazard, and it should be replaced promptly.

The cords were attached to all the upright cleaners with a cable reinforcement of spring metal or heavy rubber to absorb the stress of frequent bending at the point of attachment. On the tank-type *Electrolux*, the cord was not permanently connected to the tank, but plugged into it. The *Universal* cord was fitted with a clamp to absorb stress while the cords on the *Eureka* and *Ward's All-Purpose* were knotted for the same purpose. On the *Royal* and the *Royal* cords, a few windings of tape were supposed to do the job. The separate plug and the clamp were considered best; the knot, next best; and the tape the least desirable.

The following features were tested or examined by CU on all cleaners: dirt removal, lint removal, construction of the cleaner, maneuverability, weight, length of cord, type of cord reinforcement, accessibility of the motor brushes, power consumption, noise, shock hazard and dielectric strength.

Upright cleaners were also tested and examined for nap adjustment, ease of turning the wheels, and ease of removal and replacement of the belt and the headlight. Wheels were tested to determine whether they would "crock" or leave marks on rugs (none did). The type of switch—whether hand or foot operated—was also considered with the tank-type cleaners.

All available cleaning tools were examined and evaluated as to both durability and convenience.

All these points were scored in the final ratings of the cleaners, which are listed in estimated order of all-around quality.

## Upright Type

### BEST BUY

**Hoover Model 27** (Hoover Co., North Canton, Ohio). \$57.50. Highest dirt-removal rate of all cleaners tested. Cleaner easy to maneuver. Two-position nap adjustment. Belt replacement simple. Cleaning tools could be attached without removing belt, by insertion of tool through slot on side of cleaner. Brush not adjustable, but new brush easily installed. Brush rotator had beater bars consisting of strips of metal intended to supplement brush



action and prolong effectiveness of rotor after brush becomes worn. Power consumption low. Motor noise medium. Headlight difficult to replace. Motor brushes inaccessible.

## ACCEPTABLE

(In estimated order of quality)

**Hoover Model 27** (see "Best Buy").

**Kenmore Electromatic Imperial**, Cat. No.—0711 (Sears, Roebuck). \$51.95 plus postage. Medium dirt-removal rate. Cleaner easy to maneuver. "Automatic" nap adjustment unsatisfactory (see text). Belt replacement simple. Cleaning tools could be attached without removing belt, but all dirt collected by tools passed through rotating brush, where much of it was caught. Brush adjustment difficult. Power consumption medium. Motor relatively noisy. Headlight difficult to replace. Motor brushes inaccessible.

**Eureka DeLuxe** (Eureka Vacuum Cleaner Co., Detroit). \$76. Fairly high dirt-removal rate. Cleaner fairly easy to maneuver. Two-position nap adjustment. Belt replacement difficult. Cleaning tools could be attached without removing belt by connecting them to **Attach-O-Matic** (\$3.50 extra). Brush not adjustable. Two-speed motor. Power consumption and motor noise medium. Headlight difficult to replace. Motor brushes inaccessible.

**Premier Model 21** (Electric Vacuum Cleaner Co., Cleveland). \$54.50. Medium dirt-removal rate. Cleaner fairly difficult to maneuver. Two-position nap adjustment. Cleaning tools attached by removing a plate from front of cleaner and disconnecting belt from shaft. Belt replacement simple. Three-position brush adjustment. Two-speed motor. Power consumption and motor noise medium. Headlight difficult to replace. Motor brushes accessible.

**General Electric DeLuxe** (General Electric Supply Corp., NYC). \$59.95. Fairly high dirt-removal rate. Cleaner fairly difficult to maneuver. Two-position nap adjustment. Cleaning tools attached by removing plate from front of cleaner and disconnecting belt from shaft. Belt replacement difficult. Non-adjustable brush. Two-speed motor. Power consumption and motor noise medium. Headlight difficult to replace. Motor brushes easily accessible.

**Royal Model 215** (P. A. Geier Co., Cleveland). \$48.95. Lowest dirt-removal rate of all upright cleaners tested. Cleaner difficult to maneuver. Variable nap adjustment, regulated by knob. Cleaning tools attached by removing disc from front of cleaner and disconnecting belt from shaft. Belt replacement simple. Non-adjustable brush. Power consumption low. Motor noise medium. Headlight easy to replace. Motor brushes easily accessible.

**Cadillac Model 143-A** (Clements Manufacturing Co., Chicago). \$69.95; price included cleaning tools. Fairly high

dirt-removal rate. Cleaner difficult to maneuver. Variable nap adjustment, regulated by screw. Cleaning tools attached by removing disc from front of cleaner and disconnecting belt from shaft. Belt replacement difficult. Attachments included floor brush, general utility brush, upholstery cleaner equipped with clip-on brush, radiator cleaner, spray gun, and long wand with flexible pipe. Wand and its flexible hose connector made of impregnated composition, appeared quite weak. Non-adjustable brush. Two-speed motor. Power consumption low, motor relatively noisy. Headlight difficult to replace. Motor brushes easily accessible. General construction poor.

## Tank Type

### BEST BUYS

**Electrolux XXX** (Electrolux Corp., NYC). \$69.75. Highest dirt-removal rate of tank cleaners tested. Cleaner easy to maneuver. Flexible hose connected easily, held in place by spring clip. Attachments included rug cleaner, general utility dusting brush, drapery and clothes cleaner, metal wall-cleaning brush, composition radiator cleaner, metal vaporizer and spray gun. Rug-cleaner attachment had a swivel head with one side for ordinary rug cleaning, other side (a smaller opening with comb-like device) for picking up lint. Power consumption high. Motor relatively quiet. Motor equipped with foot switch. Motor brushes accessible.

**Ward's All-Purpose Cleaner**, Cat. No.—U136M (Montgomery Ward). \$39.95 plus postage. Medium dirt-removal rate for tank cleaners. Cleaner easy to maneuver. Tank built of cardboard covered with leatherette, with metal ends; had two wheels in back, glider in front. Flexible hose connected easily, held in place by spring clip. Attachments included rug cleaner, floor brush, upholstery cleaner, drapery brush, vaporizer and spray gun. Rug cleaner attachment equipped with corrugated strip and small brush, for lint removal. Power consumption high. Motor noise medium. Switch hand-operated. Motor brushes inaccessible. Fourth in order of quality among tank cleaners; "Best Buy" because of low price.

### ACCEPTABLE

(In estimated order of quality)

**Electrolux** (see "Best Buys").

**Royalair** (P. A. Geier Co., Cleveland). \$49.95. Fairly high dirt-removal rate for tank cleaners. Flexible hose connected by turning nozzle to lock two pins in place; but seal not effective. Attachments included rug cleaner, floor brush, utility duster, two upholstery and drapery cleaners (one equip-

ped with brush) and radiator cleaner. Rug cleaner had brush for lint removal, which could be swung upward, away from contact with rug, or left down to swing freely from side to side, adjusting itself to height of nap. Use of brush tended to impede movement of rug cleaner, making it fairly difficult to maneuver. Power consumption high. Motor relatively quiet. Motor equipped with foot switch. Motor brushes inaccessible.

**Royal** (P. A. Geier Co.). \$60. Similar in construction, functioning and dirt-removal rate to **Royalair** (above), except that **Royal** had a better-appearing finish and a different-shaped wand. **Royal** attachments included spray gun and all-metal vaporizer, not furnished with **Royalair**.

**Ward's All-Purpose Cleaner** (see "Best Buys").

**Eureka** (Eureka Vacuum Cleaner Co.). \$66.50. Similar in construction, functioning and dirt-removal rate to **Ward's** (above), except that **Eureka** appeared to have better-appearing finish and cleaning attachments. These differences had no relation to cleaning action or durability. Medium dirt-removal rate for tank cleaners. Cleaner easy to maneuver. Tank was built of coated cardboard with metal ends, and was fitted with two wheels in back and glider in front. Flexible hose connected easily, held in place by spring clip. Attachments included all-metal rug cleaner, floor brush, upholstery cleaner, clothing or drapery brush, radiator cleaner, vaporizer and spray gun. Rug cleaner attachment equipped with corrugated strip and small brush, for lint removal. All attachments made of plastic, but some had metal connectors. Upholstery cleaner appeared to be made so that a brush could be attached to it, but no brush was included. Power consumption high. Motor noise medium. Switch hand-operated. Motor brushes inaccessible.

**Universal** (Landers, Frary and Clark, New Britain, Conn.). \$64.50. Lowest dirt-removal rate of all cleaners tested. Flexible hose could be connected only with difficulty, by overcoming pressure of rubber washer on end of hose. Seal not very good. Hose came out in use. Attachments included rug cleaner, floor cleaner, drapery cleaner, radiator cleaner, vaporizer and spray gun. Plastic rug cleaner appeared flimsy; equipped with small brush for lint removal, which made it difficult to maneuver. Indicator light in handle to signal when bag was full of dust was not considered useful by CU technicians because amount of dust needed in bag to turn on light was far greater than maximum amount that should be collected before emptying bag. Power consumption high. Motor noise medium. Motor equipped with foot switch. Motor brushes inaccessible.

# Prefabricated Houses

*Those available leave much to be desired and they're more expensive than the price tags show*

by Simon Breines, A.I.A.

Today's unprecedented housing shortage is, in large measure, responsible for the intense public interest in prefabrication. Never has consumer demand for shelter been so great. There are too few dwellings to go around, and there seems to be no effective method for providing new homes at reasonable prices. Add together the facts that practically no new housing was built in the past five years; that deterioration, fires and other "natural" causes have reduced the available supply; and that more people have money to spend for a decent home, and you get a background picture of the current sellers' market.

In such a situation, any promising solution is welcomed. Even straws are grasped at. People can't buy or rent homes, so they read about them. And the editors and publicity boys are having a field day with their plastic and aluminum mass-produced, prefabricated and packaged houses. The good old "pie in the sky" had a lot more substance than some of these dream houses.

## LITTLE-UNDERSTOOD WORD

"Prefabrication," as applied to building, is a much-used and little-understood word. To some, the "prefabricated house" means a dwelling completely finished in the factory and delivered direct to the site as a packaged, ready-to-live-in unit. To others, it means a house, all the component parts of which are manufactured centrally by one organization, and requiring only erection at the site—usually conceived in terms of a few hours. A third group—and this includes most people in the building industry itself—regards prefabrication as an evolving phenomenon. They know that various parts of a building have been prefabricated for many years and that the postwar period will stimulate considerable further development in this direction. But realistic minds in the

building industry know that the completely prefabricated "packaged" house is not yet here on any practicable scale.

The most likely development in home construction is the prefabrication of larger and larger units of the house. Years ago, for example, it was impossible to obtain factory-made kitchen cabinets; today such units are standard equipment. In the future, we shall probably find the entire kitchen, complete in one unit, available to the builder. We shall see similar rationalizations and standardizations of the bathroom, storage units, utility rooms, etc. To an increasing extent, the structure of the house itself will be prefabricated. That is, we are likely to see roof sections which come to the job with the sub-roofing and finished ceiling already integrated with the structural members. A similar development will take place with wall and floor sections. There is every indication that plumbing, electric wiring and heating will be incorporated in these prefabricated sections. If the factory-built parts are standardized in dimensions, an almost infinite variety of combinations will provide freedom and flexibility in the planning of the home. The new possibilities in functional living arrangements offered by these developments have scarcely been tapped.

But many hazards lie in the path of the family that accepts too readily any and all new house-building techniques labeled "prefabricated." For

## About the Author . . .

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one thing, the prices listed in the catalogs and sales literature are likely to be grossly incomplete. These prices are usually f.o.b. (i.e., at the factory), and involve added transportation costs to the site; they usually do not include erection costs or, if they do, the costs are likely to be grossly underestimated. The erection estimates rarely include the cost of the site itself and the cost of installing the various utilities such as sewers, water supply, gas and electricity, or the walks, driveways and landscaping, which make the house correspond to the artist's drawing in the advertising literature.

Most prefabricated houses on the market are still in an experimental stage. There is always the chance that they may not wear well, and may require considerable maintenance and repair. Furthermore, many of them will require additional expenditures to bring them up to city building code requirements.

In the present shortage, some house-buying families may be forced to buy unproven "prefabs," simply because they happen to be more available at a given time or place than other houses. There is a danger, however, that many families will be taken in by the sales talk and buy an experimental house out of preference, because they lack the information on the risks involved. Some of these families may be lucky, and get a prefab that is good value and stands the test of time. But the chances are that most of them will over-pay and be disillusioned in regard to the livability of their purchase and its capacity to withstand wear and tear.

Let us examine a few typical prefabricated houses currently offered for sale:

## TOVELL PREFABRICATED HOUSE

The New York Times, on a recent Sunday, carried a full-page ad with pictures and details stating that the Tovell house was being sold by Gimbel's Department Store for \$2399. The next day the line of prospective purchasers was so long that it was impossible to get near the model set up in the store. Public interest was still strong a week later.

The floor and wall sections of the Tovell are manufactured in Georgia and delivered "knock-down" to the site. The price includes: The various structural parts to make up the house shown on the floor plan; the plumbing fixtures (bath-room, kitchen sink,

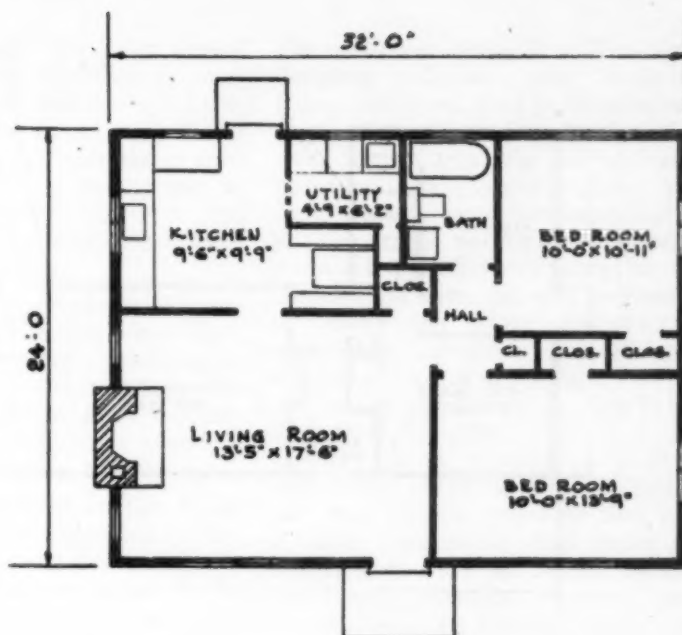




FLOOR PLANS:

Left—  
The Tovell

Right—  
The Dorset



water heater), fittings and pipes cut to size; one primary coat of paint applied at the factory; and a "space heater" (stove) which is "located in the living room and is sufficient to heat all of the house, provided the doors are left open between rooms." The price does not include: The cost of erecting the house or of installing the plumbing, electrical wiring or heating equipment; the cost of the foundations; exterior and interior painting; and roofing. In addition, the house as sold does not include screens or storm sash and weatherstripping, which would be essential where Winters are cold. It has only a single 3/4-inch-thick floor which would have to be covered by carpeting or other material to help keep it tolerable in cold weather. The hardware is inadequate and of poor quality, and lighting fixtures would be extra.

The exterior walls are of *Homasote* composition board (a compressed paper pulp). Even the additional coat of paint which the owner is to supply and apply to this exterior board will not, in the writer's opinion, render it properly resistant to the long-range wear and tear of the elements—to say nothing of small children. The interior finish is insulating board, also to be finished by the purchaser. The writer was able to dig his thumbnail into this board with ease. A chair or table pushed against the wall left a permanent dent.

The cost of erecting, finishing and fitting this prefabricated house for actual occupancy (just house, and not including the furniture) was estimated by the newspaper *PM* at an

additional \$2500. This would bring the total cost of the *Tovell* house (without land) to about \$5000—an estimate with which the writer concurs.

Now, what do you get for your \$5000? The house is 24 feet square. The living room is approximately 11 x 14 feet. Make some scale cut-outs of your furniture and try them in this room for size! And watch out for the space heater which is not shown on the plan or in the model house. The use of the bedrooms by more than one person each would seem almost impossible. There are three clothes closets for the whole family.

Suppose, however, that because of the emergency you found the plan of the house, bad as it is, tolerable. The question then is, do you gain anything by buying this house over building one of the same size by local, conventional methods? Actual small house jobs currently going through the architect's offices average \$9 to \$10 per square foot of living space at today's rates. Since the *Tovell* house has 576 square feet, it would cost between \$5186 and \$5760 to reproduce (also without land). But the comparison ends there; the non-prefabricated house would be better on every count.

Soon after Gimbel's began its prefab sales campaign, other big New York department stores plunged into the building game. Macy's is sponsoring "Precision-Built Homes" which is essentially a *Homasote* board product. Similar "prefabricated" houses are being offered throughout the

country, varying mainly in their use of one composition wall board or another. Most of these are larger and more expensive than the Gimbel job. The current offerings by Wanamaker's in New York are typical.

#### "JOHNSON QUALITY HOMES"

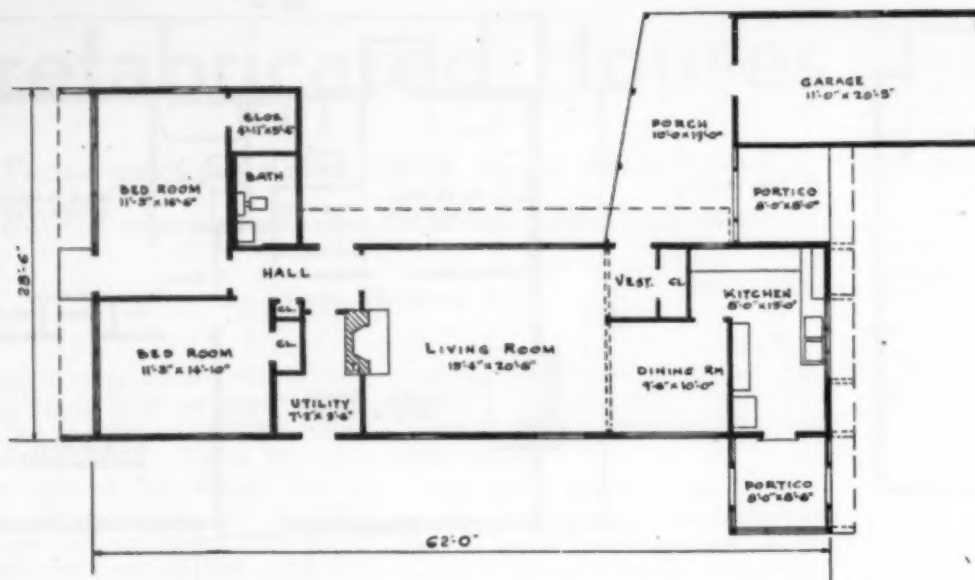
The role of the department stores in the prefab business is essentially that of catalytic agent. The houses are made and sold by the prefabricator—in this case, the John A. Johnson Lumber and Millwork Co. of Pemberton, N. J. The department store hopes to sell the home-buyer the incidental furniture, draperies, floor coverings, kitchen units, radios, decorations, etc.

The Wanamaker-Johnson exhibit pictures six complete, full-scale houses. We shall examine three of them here.

#### THE DORSET

This is a two-bedroom house with slightly larger rooms than in the *Tovell* and with other improvements such as a utility room for heater and hot water units, a breakfast nook in the kitchen, and four closets instead of three. Like other *Johnson* houses, this example is of relatively high prefab quality. In fact, it compares with the average conventionally-built, speculative (built by a contractor for resale) house, and is a prefab only to the extent that most of the structural parts are cut and assembled in the factory. Considerable field work is still involved.

The *Dorset* is tagged with a "shell"



THE MADISON is a well-designed prefab in the modern style. Its cost, including land, erection and utilities, would run to between \$16,500 and \$17,500, it is estimated.

price (basic structure only) of \$3405. The salesman advised that the completed house, erected and painted (without land) would run to between \$6000 and \$7500, depending on various alternatives such as fiberboard wall finish as against lath and plaster, etc. In the writer's opinion, the higher figure is more likely to be correct if durable materials are used.

The *Dorset* is 32 x 24 feet, or 768 square feet, which means that its cost would come to about \$10 a square foot. As has already been stated (see *Tovell* house), the cost of good, conventional small house construction in today's market is also about \$10 a square foot. In other words, it is possible to build a non-prefab the size of the *Dorset* for the same cost. Despite the many good points of this house, it would not be as sound a buy as the usual owner-built dwelling, particularly if a competent and conscientious architect were involved in design and supervision of construction.

Incidentally, the prospective owner would have to add to either the *Dorset* or its conventional counterpart the cost of the lot and improvements (street, walks, driveway, sewer connection or septic tank, water, gas and electric connections, landscaping and grading). The Urban Land Institute ("Urban Land," Vol. 5, No. 2, Feb. 1946) has made a study of the cost of site improvements. For most urban areas of the United States, this cost runs to about \$9 per front foot of lot. In other words, a 50-foot lot would cost \$450 to "improve." Thus, if the unimproved lot costs \$1000, the total cost would be about \$1500.

On such a lot, the two-bedroom *Dorset* would represent a total cost to the owner of \$9000.

#### THE CONWAY

The *Conway*, a three-bedroom Wanamaker-Johnson prefab, has a shell price of \$4445. The salesman's estimate for the complete house was \$9000 to \$10,500. This writer estimates \$11,225. This house would require at least a 60-foot lot, so that the total cost of the three-bedroom dwelling would be close to \$13,000 (i.e., ready for occupancy, but without furniture, etc.).

#### THE MADISON

Except for the plan and the modern design, this house is similar to other Johnson prefabrications. The room layout is rather good, and altogether it would probably make a very livable house. The shell price is listed at \$6136 and the completed price (less garage) at \$10,000 to \$12,500. The writer estimates that it would probably run to \$15,000 with garage and porch. A tight squeeze would get this house on a 60-foot plot so add \$1500 for land. A more realistic estimate for a lot of adequate size for the *Madison* would be \$2500. The total ready-to-live cost of this prefab would therefore be between \$16,500 and \$17,500. Anybody able or ready to spend such a sum for a house would do well to consult an architect and explore local building possibilities before going ahead.

In the previous examples we have been discussing houses which are not truly prefabricated in the popular and proper sense of the term. The

*Tovell* and the *Johnson* houses are only partially fabricated in the factory and still require considerable fabrication at the site. The completely shop-fabricated dwelling about which so much has been written is rarely encountered even in theory. Perhaps the only full-fledged example of the prefabricated house is that developed by Buckminster Fuller of *Dymaxion* fame.

#### FULLER-ALUMINUM PREFAB

Here's something new. This aluminum, circular dwelling-machine, in the opinion of *Fortune* (April 1946), "has a better than even chance of upsetting the building industry."

It weighs only one-tenth as much as a conventional house of the same size; it comprises about 1000 square feet, distributed among a living room, two bedrooms and baths, and a kitchen. The exterior wall is composed of an insulated *Plexiglass* (unbreakable) window and sheet aluminum. The floor is plywood on structural aluminum ribs. The fireplace in the living room is stainless steel. Year-round air-conditioning and indirect lighting are built-in features. In fact, everything to make for modern, convenient living is incorporated in this house: deep-freeze unit, dishwasher, garbage disposal gadget, washing machine and dryer, revolving storage shelves, and variable interior color schemes turned on by an electric switch.

This dwelling unit is really prefabricated to the last detail by mass-production airplane techniques. It is claimed that a crew of ten men can erect one on your lot in an eight-



hour shift. But don't try to place an order yet; they won't be available until 1947, according to the publicity, and probably not even then. A figure of \$6500 is being tossed around as the probable cost. Who knows what it will be in 1947?

Fuller's aluminum house indicates what we may expect when the best designers and fabricators really get serious. It is unquestionably a wonderful engineering job, and, in this writer's opinion, completely functional (convenient) and good-looking. However, an attempt at evaluation from the point of view of the family that needs a house today is somewhat academic. There is no certainty when the Fuller house will be on the market in large quantity, although it is a safe guess that it won't be for several years. By the same token, its probable price may be higher than the \$6500 publicity figure. But even if this price is correct the circular plan and continuous window would require at least a 100-foot lot in the city, and the chances are that it would need about one-half acre for privacy, which would mean about \$10,000 in all.

When the Fuller house is on the market, it will still have to be approved by city building codes, which are notoriously conservative and

slow-moving, and this might delay its use on any but suburban or rural sites. In any case, the average prospective purchaser would be well-advised to restrain his enthusiasm until he has had a chance to see one of these prefabs actually lived in, and has talked with the occupants instead of with the salesman.

This is not to question the extraordinary advantages of this house. But, in this article, we are attempting to advise people of moderate means who need or want a house in the foreseeable future, and who can't afford to experiment themselves.

As a final comment on this house we might discuss the question of dismountability. A great deal of significance is supposedly attached to the fact that the prefab can be taken down almost as easily as it is erected. This feature may be important for certain uses such as military huts, construction shacks or Summer camps. But it is of no practical value for the average home, and it is certainly not a feature worth paying extra for. Once an urban house (prefab or conventional) is set on its site, it represents an investment of several thousand dollars in added land improvements alone. This investment would be lost if the house were moved away. In most cases, it would be more economical to sell the house and to purchase a new one. This point is usually overlooked in discussions of prefabrication. The aluminum prefab may live up to Fuller's prediction, but it is not something for CU readers to be concerned about just yet.

#### CONCLUSION

The house-building industry is moving toward prefabrication, but it still has a long way to go. Large-scale prefabrication of houses is still in the experimental stage, and the industry has not yet succeeded in producing lower costs than for conventional construction. The large companies which will probably do the bulk of the prefab business will undoubtedly merchandise products well-designed from the architectural and engineering point of view. Thus, although not cheaper per cubic foot, they may be more efficient per cubic foot. But because of the nature of large-scale production, and because of the higher transportation costs associated with prefabrication, the large manufacturers will probably empha-

size *minimum space*. It will be well-designed, efficient and "built-in" space, but it will tend to be relatively small. Hence, for many families that want ample area, the prefabricated home will have shortcomings. For some time to come, the local builder will probably continue to provide more (if less efficient) space for the dollar—and even he will eventually use more and larger prefabricated units, thus approaching the efficiency of the well-planned prefabs.

There is also the danger that in the rush to make quick profits from the building boom, speculative builders and some prefabricating companies will trim corners wherever they can, to meet competition. And under the magic spell cast by "home ownership" and "scientific progress," prefabrication may become merely the password for admitting to the building field a horde of stingy little houses offering the bare minimum in living facilities.

Don't buy a prefab from a picture or even a model exhibit. Wait until you can see one actually lived in, and in a real setting. Talk to the occupants, preferably with at least one year's experience with the house in question. And wherever possible, get disinterested professional advice beforehand.

## Prefabricators

If you want to buy a prefabricated house, or if nothing but a prefab is available, your safest bet is to buy from one of the older-established prefabricators, whose houses have stood the test of time. These include:

**Gunnison Homes, Inc. (U.S. Steel)**

**John A. Johnson Co.**

**National Homes Corp.**

**American Houses, Inc.**

**Allied Housing Associates, Inc.**

**E. F. Hodgson Co.**

**Fuller Houses (Beech Aircraft)**

## Watch for . . .

Work on the following reports, among others, is either now under way or scheduled to begin soon:

**Console Radios**

**Radio-Phonographs**

**Washing Machines**

**Refrigerators**

**Portable Typewriters**

**Auto Storage Batteries**

**Plastics**

**The Use of DDT**

**Golf Balls**

**Soap Substitutes**

**Frozen Foods**

**Fruit Juices**

**Hair Preparations**

# Radios

Out of 12 new small radios tested, two were "Not Acceptable" and none were "Best Buys"

Two "Not Acceptable" radios have emerged in CU's tests of 12 new table model sets. These 12 bring the total of postwar table model radios tested by CU to 33. Except for one brand, all the 12 sets were ordinary radios, with no new features in circuit design, cabinet construction or general appearance, to distinguish them from the 21 midget and table model sets previously rated in the present series of tests.

The *Teletone 100* and *Teletone 122* were the first radios to be judged "Not Acceptable" since the tests of postwar models began. Both sets, which appeared to have identical insides, were considered poor on the basis of over-all quality.

The only distinguishing features were found in the *Stewart-Warner 9003B*, which had a three-position tone-control, two short-wave bands and push-button tuning. But the set was rated down in quality because of its objectionable, boomy tone, which was actually found to be poorer than that of Sears, Roebuck's *Silvertone*, priced at \$8.88 (see *April Reports*). The *Stewart-Warner* cost \$82.70, almost three times the average price of the other radios in this test, and nearly twice the price of the set rated highest on over-all quality so far.

The *Stewart-Warner* and the *Sonora*, along with the *Philco 46-421*, the *Garod 5A2*, and the *Emerson 519*, all had a noticeable hum. Although every a-c radio does hum to a certain extent, the hum should not be audible when you are more than about two feet away from the set. Sounding somewhat like a very low note on the piano, a noticeable hum can interfere with your enjoyment of music, and it may increase as time goes on. When buying a radio for use on a-c power, you can check for hum by listening to the set with the volume turned down. It is a good idea to make this test in the store, on the receiver you intend to buy, for the amount of hum is likely to vary from set to set of a given make and model. Although hum was not mentioned in the ratings of most sets previously

tested by CU in this series, it has been taken into account in the quality ratings of every set. The ratings this month indicate which of the radios on this and earlier tests had a noticeable hum.

More table model and midget radios will be reported on by CU as they become available. Tests are also being conducted for future reports on console models, including radio-phonograph combinations, which are slowly beginning to appear on the market, and also on portable receivers.

Prices given in the ratings were OPA Zone I ceilings. On the models tested, Zone II prices were about 5% higher. Unless otherwise stated, brands were available nationally.

## BEST BUYS

The following were judged to offer the best values for the money in the order given:

**Admiral 6TO1-6A1** [see *March Reports*] (Admiral Corp., Chicago). \$27.95. Six tubes including rectifier. Small table radio (9"h. x 12"w. x 7"dp.) in brown plastic cabinet. Relatively good tone and volume; excellent sensitivity; excellent automatic volume control; fair interference rejection. Dial poorly calibrated. Note that this six-tube *Admiral* was priced lower than the five-tube *Admiral 6T04-5B1*, below.

**Motorola 65X11** [see *February Reports*] (Galvin Mfg. Corp., Chicago). \$26. Six tubes including rectifier. Large midget radio (8"h. x 12"w. x 7"dp.) in brown plastic cabinet. Relatively good tone, volume and sensitivity; excellent interference rejection. No short circuit hazard but slight shock hazard.

**Airline Cat. No.—1504M** [see *April Reports*] (Montgomery Ward). \$17.95 plus postage. Five tubes including rectifier. Midget radio (7"h. x 10"w. x 6"dp.) in ivory plastic cabinet. Fairly good tone; excellent volume; fair sensitivity; poor interference rejection. No short circuit hazard but some shock hazard. Police band. Available also in brown plastic cabinet at \$17.50 plus postage as Cat. No.—1503M.

**RCA 56X** [see *March Reports*] (RCA Mfg. Co., Camden, N. J.). \$24.10. Six

tubes including rectifier. Large midget radio (8"h. x 12"w. x 7"dp.) in brown plastic cabinet. Fairly good tone; good volume and sensitivity. Fairly good interference rejection. Treble control switch. No short circuit or shock hazard; Underwriters' approved.

**Silvertone Cat. No.—6002** [see *April Reports*] (Sears, Roebuck). \$8.88 plus postage. Four tubes including rectifier. Small midget radio (5"h. x 6"w. x 4"dp.) in ivory-color metal cabinet. Fair tone; low volume; poor sensitivity; poor interference rejection. No short circuit hazard, but slight shock hazard; Underwriters' approved. This radio had a hank antenna—a length of wire which must be thrown out into the room or outside the window—instead of the usual loop antenna. Although relatively low in quality, this was considered a satisfactory "minimum" radio, and a "Best Buy" because of its exceptionally low price. Noticeable hum.

## ACCEPTABLE

(In estimated order of over-all quality)

**Motorola 65T21** [see *February Reports*] (Galvin Mfg. Corp.). \$45.50. Six tubes including rectifier. Table radio (10"h. x 18"w. x 10"dp.) in wood cabinet. A-c only. Excellent tone, volume and sensitivity; fair interference rejection. No shock or short circuit hazard. Good combination bass-and-treble tone control; short wave band.

**Admiral 6TO1-6A1** (see "Best Buys").

**Motorola 65X11** (see "Best Buys").

**Admiral 6T04-5B1**. \$34.95 (see *March Reports*).

**RCA 56X** (see "Best Buys").

**Gilfillan 56E** (Gilfillan Bros., Inc., Los Angeles). \$27.15. Five tubes including rectifier. Large midget radio (7"h. x 12"w. x 6"dp.) in mahogany finish cabinet. Fairly good tone; excellent volume; fairly good sensitivity; fair interference rejection. Slight shock hazard, but no short circuit hazard; Underwriters' approved. Police band. Available in West.

**Sonora RB-176** (Sonora Radio and Phonograph Corp., Chicago). \$22.50. Five tubes including rectifier. Large midget radio (7"h. x 11"w. x 6"dp.) in white plastic cabinet. Fairly good tone; good volume; fair sensitivity and

This is the fourth of CU's current series of reports on midget and table model radios. Complete reports on each of the sets listed in the ratings can be found in the issues referred to in the ratings, and an article describing fully what you should look for in buying a small radio will be found in the February issue of *Consumer Reports*.



interference rejection. No shock or short circuit hazard. Noticeable hum. **Philco 46-421** (Philco Radio and Television Corp., Philadelphia). \$34.95. Six tubes including rectifier. Small table model (8"h. x 14"w. x 7"dp.) in mahogany finish cabinet. Fairly good tone; good volume; fair sensitivity; fair interference rejection. Slight shock hazard, but no short circuit hazard. Noticeable hum.

**Philco 46-4201** (Philco Radio and Television Corp.). \$29.95. Six tubes including rectifier. Large midget radio (8"h. x 11"w. x 7"dp.) in ivory plastic cabinet. Fairly good tone but somewhat tinny; fairly good volume; fair sensitivity and interference rejection. Slight shock hazard but no short circuit hazard.

**Airline** (see "Best Buys").

**Pilot B-3**. \$35.35 (see February Reports).

**Pilot T-3**. \$44.40 (see February Reports).

**Temple E-514-M**. \$29.95. Noticeable hum. (See February Reports.)

**Silvertone 6051**. \$29.45. Noticeable hum. (See February Reports.)

**Travler 5002**. \$23.15 (see April Reports).

**Macy's 6511**. \$24.94. Noticeable hum. (See April Reports.)

**Garod 5A2** (Garod Radio Co., Brooklyn, N. Y.). \$26.60. Five tubes including rectifier. Small midget radio (5"h. x 10"w. x 4"dp.) in brown plastic cabinet with red grille. Fair tone; excellent volume; fairly good sensitivity; fair interference rejection. Short, crowded dial. Slight shock hazard but no short circuit hazard. Noticeable hum.

**Farnsworth ET-064** (Farnsworth Television and Radio Corp., Fort Wayne, Ind.). \$23.15. Six tubes including rectifier. Large midget radio (8"h. x 12"w. x 6"dp.) in black plastic cabinet. Fair tone; good volume; fair sensitivity and interference rejection. Slight shock hazard but no short circuit hazard; Underwriters' approved.

**Emerson 519** (Emerson Radio and Phonograph Corp., NYC). \$32. Five tubes including rectifier. Large midget radio (9"h. x 11"w. x 6"dp.) in brown wood cabinet. Good tone; excellent volume; poor sensitivity and interference rejection. Slight shock hazard but no short circuit hazard; Underwriters' approved. Noticeable hum. Insides appeared to be identical with *Emerson 518, 510, 502 and 507* (below). Differences between the several *Emersons* rated, all of which appeared to have identical chassis, were probably due to variations in adjustments and parts.

**Philco 46-2501** (Philco Radio and Television Corp.). \$23. Five tubes including rectifier. Large midget radio (7"h. x 11"w. x 6"dp.) in ivory plastic cabinet. Tone fairly good but somewhat tinny; fairly good volume; poor sensitivity; fair interference rejection. Slight shock hazard but no short circuit hazard.

**Emerson 518**. \$20 (see April Reports).

**Emerson 510**. \$32. Noticeable hum. (See April Reports.)

**Emerson 502**. \$35. Noticeable hum. (See February Reports.)

**Philco 46-200**. \$19.70 (see April Reports).

**Emerson 507**. \$20 (see February Reports).

**Sentinel 93 W** (Sentinel Radio Corp., Evanston, Ill.). \$28.50. Six tubes including rectifier. Large midget radio (8"h. x 11"w. x 6" dp.) in brown plastic cabinet. Fairly good tone; excellent volume; very poor sensitivity; fair interference rejection. Shock and short circuit hazards.

The following was considered a satisfactory "minimum" radio:

**Silvertone Cat. No.—6002** (see "Best Buys").

The following radios were rated low in quality because of poor tone:

**Stewart-Warner 9003B** (Stewart-Warner Corp., Chicago). \$82.70. Seven tubes including rectifier. Large table radio (12"h. x 20"w. x 10"dp.) in walnut cabinet. A-c only. Poor, boomy tone; excellent volume; very poor sensitivity; fairly good interference rejection. Three-position tone control; separate short wave and police bands. No shock or short circuit hazard. Current consumption about twice as high as that of most other sets tested. Noticeable hum.

**Stromberg-Carlson 1100-H**. \$31.95 (see March Reports).

**General Electric 100**. \$29.30. Noticeable hum. (See March Reports.)

**Bendix 0526A**. \$22.95 (see March Reports).

## NOT ACCEPTABLE

The following radios were judged "Not Acceptable" because of their poor rating on over-all quality:

**Teletone 100** (Teletone Radio Co., NYC). \$27.55. Five tubes including rectifier. Large midget radio (8"h. x 12"w. x 6"dp.) in ivory wood cabinet. Fair tone; good volume; very poor sensitivity; poor interference rejection. Police band. Recessed tuning and volume-control knobs were difficult to grasp. Short, crowded dial. Slight shock hazard but no short circuit hazard. Insides appeared to be identical with *Teletone 122*.

**Teletone 122** (Teletone Radio Co.). \$24.95. Five tubes including rectifier. Midget radio (7"h. x 10"w. x 6"dp.) in brown leatherette cabinet. Fair tone; good volume; very poor sensitivity; poor interference rejection. Police band. Recessed tuning and volume-control knobs were difficult to grasp. Short, crowded dial. Shock and short circuit hazards on two back screws. Insides appeared to be identical with *Teletone 100*.

# Aquella

A highly-touted waterproofing preparation that was **not** rated "Excellent" by the Bureau of Standards.

Do the masonry walls of your house leak? Is your basement damp? If so, *don't* rush to the nearest hardware store and buy *Aquella*, or for that matter, *don't* buy *Aquella No. 2*. They're not what they're cracked up to be.

If you're one of the ten million readers of *Reader's Digest*, or one of the 65,000 readers of *Forbes Magazine*, you probably know something about *Aquella* already. For both of these magazines carried panegyrics on *Aquella*. The *Forbes* story appeared in the December 15, 1945 issue, under the title, "At Last—Dry Cellars!" In January 1946, *Reader's Digest* carried a digest of the *Forbes* article under the title, "Water, Stay Away From My Wall."

## CALLED A "BLESSING"

If you believe what you read in *Reader's Digest*, you have learned that, "The Maginot Line, symbol of colossal failure, yielded one blessing to American householders." That blessing, according to the *Digest* article, was *Aquella*.

Early in its history, we are told, the Maginot Line leaked. "Some quarters filled with water so rapidly that pumps were useless," says *Reader's Digest*. "Even where pumps could handle the seepage, it was damp and clammy." After the French government had tried all known waterproofings and found them useless, according to the romantic story, it offered a reward for the development of a new process. *Aquella* was the answer to the government's prayer.

This story would be quite unimportant were it not for the fact that *Aquella* is now being widely distributed in this country, and that about

one out of every five houses has leaky concrete, brick or other masonry walls. The potential demand for waterproofing is, consequently, enormous. The build-up that *Reader's Digest* gave *Aquella* has made house-holders in every part of the country eager to try the stuff. Some who are cautious or skeptical have written Consumers Union to check up on this new "scientific mineral surface coating."

#### BUREAU OF STANDARDS ON AQUELLA

The U.S. Bureau of Standards also received letters, because its name was specifically used in both the *Reader's Digest* and *Forbes Magazine* articles in implied support of *Aquella*. In fact, the Bureau of Standards received such a deluge of inquiries that it prepared two three-page mimeographed form letters in reply. Referring to the articles on *Aquella* in *Reader's Digest* and *Forbes Magazine*, the Bureau of Standards in its letters said, "There are a number of inaccuracies in the articles." . . . and . . . "Letters were sent to the Publishers calling their attention to the inaccuracies."

What were these inaccuracies? That they were of prime importance, and not trivial details, is shown by the following quotation from *Reader's Digest* and its refutation by the Bureau of Standards. The *Digest* said, "Samples of the white powder were submitted to the cold-eyed researchers of the National Bureau of Standards. Only a short time before the Bureau had made 30 different water-proofing tests. Twenty the Bureau called 'very poor,' five 'poor.' Only two rated 'excellent'—and both called for *specialty built walls*." But is it true that only two samples were rated "excellent" by the Bureau of Standards, and that these required "specialty built walls"? The Bureau of Standards itself says, "No." Its form letter remarks on this point, "The latest of our publications on water proofings for masonry walls (BMS 95) cites *eleven* that were so rated [excellent] when first tested on *ordinary walls* and nine [rated excellent] after an exposure outdoors for twelve or more months."

The Bureau of Standards goes on to say, "The *Reader's Digest* article also states that the proprietary product [*Aquella*] was rated 'excellent,' whether applied on the inner or outer faces of walls; *whereas* this coating on the inner face was rated 'good'

when first tested and 'poor' after exposure outdoors." The Bureau concludes, "In general, the performance of *Aquella* in our test was inferior to some of the other treatments described in BMS 95 and was no better than many of them."

Exactly what *Reader's Digest* gains by touting *Aquella* is anyone's guess. Why *Reader's Digest* publicized the name of *Aquella's* manufacturers, Prima Products, Inc., of New York, is also anyone's guess. The article in *Forbes Magazine* did not contain the name Prima Products, Inc., but it was inserted in the *Digest's* "digest."

#### WHAT IS AQUELLA?

Prima Products says *Aquella* is "The Scientific Mineral Surface Coating." It is "an absolutely dependable water-proof and damp-proof coating." Best of all, "*Aquella* fills and closes each microscopic pore."

But, Prima Products keeps *Aquella's* ingredients a carefully guarded secret. And for good reason. Analysis of samples obtained on the open market showed that this expensive, new "waterproofing" did not justify its labeling as an "Amazing Water-proof Surface Coating." The analysis showed that it consisted principally of the following ingredients: white Portland cement, quartz (fine sand) and limestone. A mixture of this kind would fall under the class commonly known as cement water paint. Cement water paints, which are readily compounded by an individual or can be purchased on the open market, are employed commonly for waterproofing masonry exteriors. The Bureau of Standards lists many simple compositions as being excellent waterproofing agents, and despite the statement in *Reader's Digest*, *Aquella* was found to be substantially the same in its formulation as any other cement water paint.

The rating which it received in the Bureau of Standards tests is no better than that of several other cement paints used for waterproofing. In fact, nine simple cement paints were rated "excellent" under conditions where the *Aquella* material rated only "good."

#### AQUELLA AND AQUELLA NO. 2

In order to prevent leakage, masonry walls may be treated on the exterior or on the interior. It is very much easier to obtain a good result by waterproofing the exterior. And this, in fact, constitutes general prac-

tice. However, the exterior walls are sometimes inaccessible. Most basement walls, for example, are sub-grade. In that case, waterproofing of the interior basement walls may be tried. However, according to Bureau of Standards research, a different waterproofing mixture and different waterproofing procedure must be followed. Instead of a thin coat of waterproofing paint which may be satisfactory for the exterior, a layer of Portland cement mortar must be plastered up to about one-half inch thick on the interior walls in order to obtain effective results.

Because of the relative difficulty of waterproofing the interior walls, procedures other than waterproofing are frequently resorted to. Basement walls may be kept dry by the use of drainage tiles, or the grade of the land surrounding the house may be changed to divert water away from the house.

In its advertising literature, Prima Products says *Aquella* should be used for interior walls and *Aquella No. 2* for exterior walls. This would lead one to believe that *Aquella* and *Aquella No. 2* are two different products. Since *Aquella No. 2* is a cement paint, and since cement paints are not generally suitable for interior waterproofing, it would be reasonable to expect that *Aquella* would not be a cement paint. However, this is not so. Both *Aquella* and *Aquella No. 2* were found to be cement water paints. There was almost no detectable difference between *Aquella* and *Aquella No. 2*. Both consisted essentially of a mixture of white Portland cement, fine quartz and fine limestone. The exact chemical composition of *Aquella* differed slightly from *Aquella No. 2*, but probably not much more than two different samples of *Aquella*, or two different samples of *Aquella No. 2* would differ among themselves. The chemical composition of *Aquella No. 2*, which corresponds to its principal ingredients, is given in the following analysis taken from the *Bulletin* of the Board of Standards and Appeals, City of New York, volume XXIX, page 477, June 6, 1944:

Silica (SiO <sub>2</sub> )	41.46%
Iron Oxide (Fe <sub>2</sub> O <sub>3</sub> )	0.16%
Alumina (Al <sub>2</sub> O <sub>3</sub> )	7.02%
Calcium Oxide (CaO)	42.26%
Magnesia (MgO)	0.96%
Sulfuric Anhydride (SO <sub>3</sub> )	0.95%
Volatile Material (on heating)	6.96%



Since it contains Portland cement, *Aquella No. 2* comes under the class of the commonly-known cement water paints. Many formulations of cement water paints based on the prime ingredient, white Portland cement, have been tested by the Bureau of Standards. The labeling of this material as an interior waterproofing, whether it is called *Aquella* or *Aquella No. 2*, is contrary to ordinary good practice for cement water paints. And it is not surprising that the Bureau of Standards rated it "good," and on later exposure "poor," as an interior waterproofing. This means that the user may expect that neither *Aquella* nor *Aquella No. 2* would, in the long run, be a satisfactory waterproofing for basement dampness—at least no more satisfactory than many another cement water paint.

It is, indeed, all the more astounding in view of the above that *Aquella No. 2*, which is recommended by the manufacturer for exterior use, is also recommended by the manufacturer as suitable for interior use. If *Aquella No. 2* is suitable for both inside and outside use, there seems to be no reason why *Aquella* (for interior use only) should be substantially different from *Aquella No. 2*. The answer is, it isn't. The only outstanding difference between *Aquella* and *Aquella No. 2* is the *No. 2*.

#### AQUELLA IS EXPENSIVE

Householders want two things in a waterproofing preparation: It should be effective and it should be moderately priced. *Aquella* obtained a rating of "good" when first tested by the Bureau of Standards on an inner surface and "poor" after a standard exposure outdoors and re-test indoors; which doesn't speak too well for its effectiveness. By contrast, other coatings received ratings of "fair" to "excellent" after a standard exposure outdoors and re-test indoors.

So far as price is concerned, *Aquella* definitely is not cheap. It retails at \$3.95 for an 8½-pound bag which, when mixed with water, makes one gallon of waterproofing. But one gallon doesn't go very far. The manufacturer states that for the first coat on cement, brick or similar surfaces, one gallon will coat 70 square feet. The second coat goes further, from 200 to 250 square feet. Since a basement may have about 1000 square feet to be waterproofed,

the cost of *Aquellizing* the inside would be about \$75. Since the ingredients of *Aquella* can be purchased for about 3¢ per pound, in comparison with 46¢ a pound for *Aquella*, purchasers of *Aquella* are paying a markup of 1500%. The cost of coating 1000 square feet with an equal amount of cement, fine sand and limestone would be \$5 instead of \$75. Commercially prepared cement water paint can be obtained on the market at about 16¢ a pound, giving

a total cost of \$26 for a high grade commercial paint, as against \$75 for *Aquella*.

But usually one would not waterproof inside walls with *Aquella* or any other cement water paint. Only exterior masonry walls should be treated with cement water paint. Interior walls require different treatment, which will be discussed in detail in a subsequent article on the subject of interior and exterior masonry waterproofings.

## Window Boxes

*CU's consultant describes how to prepare and care for a window box and lists the most satisfactory plants for windows in sun or shade.*

Growing plants in city window boxes is a very special type of gardening with its own exacting requirements. Disregard of these requirements can mean failure, but anyone who understands them can have a thriving window-box garden, in sun or in shade, on the ground floor or twenty-five stories up.

Success depends on the right kind of box, proper drainage, the right soil, selection of healthy plants of the right kind for the situation and, last but not least, faithful and correct watering and fertilizing.

Almost all window boxes look gay in the Spring, but after the first hot spell of Summer many of them look faded, and by August they look very sad indeed if they are not properly cared for.

#### THE PROPER BOX

To be successful, window boxes should not be made of metal, nor should they be too skimpy in size. Narrow, shallow boxes dry out too quickly, and do not provide enough room for an effective display. Metal conducts heat and, under a Summer sun, literally roasts the plant roots. Even so-called self-watering or sub-irrigating metal boxes, which have a tube or trough into which water is poured, are not satisfactory for sunny situations. Metal boxes are likely to leak, too. In general, metal boxes are not recommended, even though they are more widely sold than any other kind. If metal boxes are the only kind available, get the "self-watering" or "sub-irrigating"

type. For a sunny situation paint them ivory white to help repel the sun's heat. Be sure to mulch the soil with peat moss.

Some of the best-looking boxes are made of tile, terra cotta or concrete. These are satisfactory provided they are at least eight or nine inches deep inside, and have holes for drainage. If there are no drainage holes, such boxes should be at least ten inches deep in order to allow for two, or preferably three inches of coarse drainage material (washed hard coal cinders, gravel, broken flower pot pieces, etc.) under the correct depth of soil. In shallow boxes without drainage, the plants should be left in their pots.

#### WOODEN BOXES SCARCE

Well-made wooden boxes are best, but they are the hardest to find. They should be made of white pine, redwood or cypress boards not less than one inch thick, to resist warping, and should be not less than eight inches deep and ten inches wide on the inside. If evergreens or shrubs are to be planted in them, the boxes should be larger, but don't buy boxes so wide that they project more than a few inches beyond the window ledge. The length of a box will be governed by the size of the space to be filled, but any box over three feet long will be very heavy to handle. If you have a longer space, use more than one box. The bottom of the window box should have ½-inch drainage holes about six inches apart. Boxes should be put together with rust-proof

screws and angle irons. To prevent rotting of the wood, a coat of asphalt chromate emulsion or Cuprinol may be applied on the inside of the box. Or a few coats of linseed oil will give some protection. Do not apply ordinary paint or creosote; both are harmful to plant roots.

Consider the flower colors you want to use, as well as the color of the building, when choosing a color for the window box. Ivory is good with almost any color and it helps repel the sun's heat; pure white is generally found less attractive. Unless you choose the right shade of green for the box, it may clash with the plant foliage.

If the window ledge slopes down, put a long, thin piece of wood under the outside edge of the box to keep it level. Be sure to anchor the box to the sill in some way. Wires can be secured to the box and then to the sill or window frame with strong screw eyes. Apartment house dwellers should consult the management, in any case, before attempting to install a window box.

#### PLANTING THE BOX

**WITHOUT EXTRA SOIL:** An easy and inexpensive method for using metal or shallow, undrained tile, terra cotta or concrete boxes is to put a layer of pebbles or sand on the bottom, and arrange the plants, leaving them in their pots. Keep a little water in the bottom of the box, but not enough to soak the roots. The layer of sand or pebbles should be deep enough to bring the tops of the pots to the correct level. Moistened peat should be packed around the pots to prevent drying out, especially in sunny locations.

**PLANTING IN SOIL:** Results are usually better when the plants are taken out of their pots and transplanted to the window box soil. When this is done, drainage must be provided, for plants vicken if they stand in water just as surely as they wilt from drought. In boxes without drainage holes, a two- or three-inch layer of drainage material, into which excess water will drain, should be laid at the bottom. Washed hard coal cinders broken into 1/4- to 1/2-inch pieces, small pieces of broken flower pots, shells, gravel, coarse sand, peat or sphagnum moss may be used. It is a good idea to put a thin layer of sphagnum moss (which can be bought from a florist) over coarse material. In wooden boxes the excess flows off through

the drain holes in the bottom, and the layer of drainage material need be only an inch deep. A piece of broken flower pot should be placed over each drainage hole. Hard coal cinders are especially good in wooden boxes, because they retain some of the moisture and give it back to the plants. A zinc tray under the box is ideal to catch the drip, but a thick layer of blotting paper is easier to come by nowadays.

**SOIL FOR WINDOW BOXES** should be a mixture designed to retain moisture. Some florists and seedsmen keep potting and window-box compost for sale, and ingredients for making your own mixture can be bought from nurserymen, florists, and seed, department and 10-cent stores. Your own compost can be better than the prepared kind, but it is something of a chore to make in a city apartment.

There are various formulas for window-box soils, many of them calling for well-rotted manure, which is difficult to obtain. An excellent and practicable recipe is as follows:

- 6 parts good garden soil  
(buy loose, bulk)
- 3 parts peat moss
- 1 part sand

To each bushel of this compost add a scant cupful of bone meal, and a like amount of dehydrated cow manure or sheep manure. For evergreens omit the bone meal and increase the amount of manure. (By "good garden soil" is meant the type of soil in which cabbages and sweet corn do well. The blackest soil is not necessarily the richest. In fact, poor bog soil is very dark indeed.)

Before mixing, the soil should be finely pulverized (rub through a 3/8-inch screen if necessary), and the peat moss should be broken up fine and well moistened. To mix, spread the loam, peat and sand in layers. Keep out some of the sand and mix well with the bone meal and dehydrated manure. Spread this fertilized sand evenly over the rest. Then cut down through all the layers and turn over three or four times.

#### FILL WITH SOIL

With the drainage material in place, fill the window box to within one inch of the top with soil, then water it thoroughly and let it stand for a day before planting.

When it is time to set out the plants, the soil balls should be damp but not wet. Knock the plants out of

the pots by holding them inverted with the hand over the top of the pot, the stem between two fingers, and rapping the top edge of the pot down sharply on the edge of a table, shelf, or other convenient place. The plants should be set rather close. A good rule is to plant so that the tops of the plants just touch, but in any case leave at least one inch between root balls. Sink them about 1/2 inch deeper than they were in the pot. After the box is planted, and the soil well firmed, cover the soil surface with a 1/2-inch layer of a moistened mixture of peat moss and dehydrated manure.

#### SHOPPING FOR PLANTS

Every effort should be made to find stocky plants with healthy foliage and no signs of disease or insect pests, for one sickly plant can infect the whole box. When buying flowering plants, choose those with several buds, rather than plants already exhausted by forcing for the Memorial Day trade. Knock the plants out of the pots to make sure the roots are not hardened. Such plants never do well.

Peddlers are unreliable sources of supply. So are shops where the plants are left outdoors in the sun. But good plants may be found at many 10-cent and department stores if you go at the right time. Find out when deliveries of fresh plants are made, and be on hand shortly afterwards. If you buy from a florist, go to a good one.

Wherever you buy, examine the plants carefully for signs of disease or insects. Turn the pots upside down and look at the under sides of the leaves. *Red Spider*, an invisible mite, makes the leaves look pale, minutely speckled and faded, and spreads the under sides with fine webs. *White Fly* is easily shown up; when the foliage is disturbed the insects fly off and then settle back again. The young are scale-like, and are on the under sides of the leaves. *Mealy Bug* appears as white, fuzzy spots, usually in the axils of the leaves. *Scales* are white, gray or brown, and of different shapes, on stems or under sides of leaves.

#### CARE OF THE WINDOW BOX

1. See that the plants *never* dry out. Even wintering-over plants should be kept watered except when the soil is frozen stiff. During the Summer, watering twice a day is not too often for some ordinary boxes.



though "self-watering" or "sub-irrigating" boxes usually need watering only two or three times a week. No specific rules can be given; you must decide by inspecting the plants and the soil when they must be watered.

2. Give the plants a shower with a fine spray at least twice a week. This prevents the pores from being clogged and keeps the plants glossy and fresh. Rubber bulbs which squeeze out water in a fine spray are good. A little mild soap in the water is a help.

3. During the first month after planting, no more fertilizer should be applied. During the second month give an application of liquid fertilizer (one heaping teaspoon of a complete chemical fertilizer dissolved in one gallon of water) once every two weeks. Beginning the seventh or eighth week after planting, apply the same amount of fertilizer once a week. Never apply liquid fertilizer when the soil is very dry.

4. Remove promptly all faded flowers, and especially any seed pods. Discard unsightly plants at once.

5. For *White Fly*, spray with  $\frac{1}{4}$  teaspoon *Black Leaf 40* in a quart of soapy water.

For *Red Spider*, use fine dusting sulfur (in hot weather), or a rotenone spray according to the manufacturer's directions.

For *Mealy Bug*, touch each insect with a toothpick dipped in alcohol.

For *Japanese Beetle*, handpick into a can of water containing a few drops of kerosene, or use a rotenone spray.

For *Scale* use *Black Leaf 40* and soap when the young are crawling from under the scales. This time comes in late Spring (for the latitude of New York late May or early June). Lift up some of the scales on the newer wood and note when the young (pale yellowish white specks) are crawling. Make two applications, ten days apart.

For all insects, repeat the applications within a few days to catch the newly-hatched young. Direct sprays and dusts to the under-sides of the leaves.

#### THE PLANTS

The City Gardens Club of New York recommends the following list of city-proof plants. These may be relied on as resistant to congested city conditions, but for more severe climates, note the remarks on hardiness. Unless otherwise noted, the plants will thrive in sun or shade.

## Shrubs

### NEEDLE-LEAVED EVERGREENS

**Japanese Yew** (*Taxus cuspidata*) is the best evergreen for the city in several of its forms. With proper care it should withstand the Winter in a box or tub, though it may have to be replaced at the end of the Winter. The dwarf shrubby forms (varieties *nana* and *densa*) are best for window boxes; the larger ones do well in tubs. Be careful that they are not near the drip from awnings or leaders, for this may damage or even kill them.

**American Arborvitae** (*Thuja occidentalis*), in its wide range of greens, is best in its small globe or conical forms. It may live over the Winter.

**Hinoki Cypress** (*Chamaecyparis obtusa nana*, or *Retinispora*) is a beautiful dwarf evergreen; it should have some sun, or very strong light.

### BROAD-LEAVED EVERGREENS

**Common Box** (*Buxus sempervirens*) in tree form is excellent for the flower tub. In the window box small forms, some with variegated leaves, may live through the Winter in New York, but excessive cold and sunburn is bad for them. *Buxus suffruticosa*, the old Dwarf Box, is not hardy in climates such as New York's; *Korean Box* (*Buxus microphylla*) is a dwarf, and hardier than Common Box.

**Euonymus** (*Euonymus radicans*) in its shrubby forms is good in sun or shade. It is loose-growing compared with Box, having leathery, almond-shaped leaves. It may stand the Winter. (See also under "Vines.") When buying, examine for white scale.

**Japanese Holly** (*Ilex crenata*, especially variety *microphylla*), one of the best broad-leaved evergreens for the city, has leaves resembling Box. It should normally winter in a box or tub.

### DECIDUOUS SHRUBS

**Regal Privet** (*Ligustrum obtusifolium Regalia num*), recognized as the best of all privets for the city, is very hardy.

**California Privet** (*Ligustrum ovalifolium*) is also good, but it may not be hardy north of New York. It comes in forms with yellow, or variegated cream or pale

yellow leaves, sometimes half evergreen. **Common Privet** (*Ligustrum vulgare*) is tolerant of city conditions, but is no hardier than California privet.

## Foliage House Plants

Certain foliage plants which have spent the Winter indoors, are good for outdoor planting when the weather is warm. Those listed below may be seen in flower shops. All have glossy leaves, and should be kept well sprayed to wash off dust. They may be taken indoors again for the Winter.

### UPRIGHT HOUSE PLANTS

**Aucuba** (*Aucuba japonica*) tolerates adverse conditions well. The glossy, toothed leaves are dark green, but there is a wide choice of varieties. These plants are dreary unless kept well sprayed or washed.

**Jade Tree** (*Crassula arborescens*), a familiar tree-like succulent with thick, rubbery leaves, oval in form, prefers sun, but grows in shade. It requires little moisture and grows well in a small pot.

### TRAILING HOUSE PLANTS

**Emerald Feather** (*Asparagus sprengeri*), with its feathery, linear "leaves" like little spikes along trailing green stems, will trail down several feet over the side of the box. It stands partial shade.

**Grape Ivy** (*Cissus rhombifolia*) is almost as leathery as English Ivy, with strong stems and leaves.

**Philodendron** (*Philodendron cordatum*) is a very tolerant vine, with heart-shaped leaves about three or four inches long.

**Pothos** (*Scindapsus* or *Pothos aureus*) is similar to Philodendron, but its leaves are less heart-shaped and they are sometimes blotched with yellow when the sun hits them.

**Wandering Jew** (*Tradescantia fluminensis*), a well-known bright green trailer, will cascade beautifully over the window box. One variety is striped with yellow and white. Another variety, *Zebrina pendula*, has leaves with silver stripes above and purple beneath.

## Vines, Edgings and Trailers

A cascade of vines over the edge of a window box may create a broad expanse of green and conceal a homely box, but a good looking box can be decorative without any trailers, or with trailers only at the ends.

**English Ivy** (*Hedera helix*, and variety *baltica*) is probably the most satisfactory of all vines. The *baltica* is hardier than the common form. Ivy grows in sun or shade, but prefers the shade, especially in Summer when sun may burn the leaves. May survive the Winter in a sheltered position, though it may grow

### Correction

In the preliminary article on Storage Batteries (page 73, March 1946 Reports) Sears, Roebuck's Allstate Cross Country Cat. No. — 28DM46F was erroneously listed among the double (glass) insulated battery. It should have been listed instead as the last item among single (wood) insulated batteries.

very shabby and then revive with Spring. Laying it down inside the box may save it in severe climates. Ivy likes moisture and fertilizer.

**Kenilworth Ivy** (*Cymbalaria muralis*), a dainty little trailer with minute leaves, threadlike stems, and extremely small lilac-blue flowers, needs only an hour or two of sun a day. It dies to the ground with frost.

**Edging Lobelia** (*Lobelia erinus*), a semi-trailing plant, with small blue, white or pink flowers, is not Winter-hardy. It stands half shade.

**Euonymus radicans** and variety **mini-mus** are hardy vines with small, leathery evergreen leaves.

**Ground Ivy** (*Nepeta hederacea*) is a trailer and ground cover with small, round, scalloped leaves, and with tiny bluish-violet flowers in early Summer. It is cheerful in sun or almost full shade, but is too small to be effective except at close range.

**Morning Glory** (*Ipomoea*) requires almost continuous sun, and should bloom until frost. If seeds are sown in the box, avoid mixed colors. "Heavenly Blue" is better than "Scarlett O'Hara." Examine potted plants for red spider and white fly.

**Periwinkle**, or **Running Myrtle** (*Vincar minor*) is a glossy evergreen trailer, with lilac-blue flowers in Spring. Its relative, *Vincar major variegata*, a strong grower, is best for window boxes, and has larger, variegated leaves.

**Yellow Stonecrop** (*Sedum acre*) has tiny yellow flowers in early Summer, and minute leaves which will probably fall over the side of the box. Thrives in sun or half shade. Dies down in Winter, but is almost the only plant which will come up again the following season.

## Flowering Plants

(See also preceding section)

Of all plants in the following group, probably none will survive the Winter in a window box except the *Sedum*. Therefore all plants, whether perennial or annual, will serve for only one growing season. When buying potted plants, examine for red spider, white fly and mealy bug.

### FLOWERING PLANTS FOR FULL SUN

**Dusty Miller** (*Centaurea gymnocarpa*), with white, wooly leaves, valuable for their lacy effect, will grow about a foot tall.

**Blanket Flower** (*Gaillardia*), has ray flowers in yellow and red shades. The annual forms will bloom in Summer and Fall.

**Sweet Alyssum** (*Lobularia maritima*), a low edging plant with fragrant white flowers, blooms through the Summer. When it gets shabby, cut it back and it will start out fresh.

**Annual Phlox** (*Phlox drummondii*), in many colors, has a long-blooming sea-

son and may grow a foot tall. Inspect potted plants for red spider.

**Rose-Moss** (*Portulaca grandiflora*), a low plant with brilliant flowers in rose, red, yellow or white, blooms all Summer. Watch for red spider.

**French Marigold** (*Tagetes patula*), rayed yellow flowers with red and brown markings, will bloom all Summer. Grows about a foot tall. *Tagetes signata pumila* are low mounds covered with small, single yellow flowers striped with brown. All marigolds are susceptible to red spider.

### FLOWERING PLANTS FOR SUN OR PARTIAL SHADE

**Ageratum** needs sun for two-thirds of the day. The flowers are lavender "pom-poms." Buy dwarf varieties. Good and long-blooming if you can find healthy plants, but florists' plants are very often infested with red spider or white fly.

**Old Woman** (*Artemisia stelleriana*) requires half shade. It has white, wooly leaves, lacy and effective, with yellow flowers; grows one foot high.

**Begonia** (*Begonia semperflorens*), the familiar florists' begonia with red rose to white flowers and succulent green leaves, has a long blooming season in sun or half shade.

**China Aster** (*Callistephus*) needs sun at least half the day. It has purple, blue, rose or white flowers, and grows about a foot tall; blooms in late Summer. Buy wilt-resistant varieties of the lower-growing types.

**Balsam** (*Impatiens sultani*), about a foot tall, blooms through the Summer in sun or half shade. It is available with camellia-type scarlet to pink flowers near the top rather than flowers mostly hidden by the foliage.

**Geranium** (*Pelargonium*), the very best plant for window boxes, comes in a large range of colors and should bloom for months even in half shade. The plants should be stocky, with many flower buds and healthy foliage when

bought. Lady Washington varieties are short-blooming and unreliable in hot Summers. Watch for white fly.

**Petunia** blooms all Summer and Fall. The small-flowering singles will stand some shade, but large and ruffled forms need sun. There are erect, prostrate and trailing varieties. Doubles are unsatisfactory. Whenever possible, get separate colors and named varieties, not mixtures. The single bedding petunias and the "dwarf giants" are better than "balcony" petunias for resisting wind and rain, but the "balconies" are handsome trailers. Watch for white fly.

**Showy Sedum** (*Sedum spectabile*) grows marvelously in the city. It likes sun, but will stand a few hours of shade. Plants are a foot or more tall, erect and leathery-leaved; in the Fall there are dusty-pink flower heads. Variety "Brilliant" has crimson flowers. Will come up year after year even in a flower box.

**Marguerite** or **Paris Daisy** (*Chrysanthemum frutescens*), needs a great deal of sun. It may be bought from florists at almost any season. Flowers are single, white or yellow. Grows taller than the other plants listed.

**Wishbone Flower** or **Blue Wing Flower** (*Torenia fournieri*) does well in partial shade, though better in sun. It is a pretty, low-growing flower (under a foot tall) in blue, violet, purple and yellow combinations, and blooms in Summer and Autumn.

**Pansy** (*Viola tricolor*) is excellent as a filler-in in Spring, until the Summer bloomers are ready.

**Japanese Spurge** (*Pachysandra terminalis*) grows in sun or full shade. It is not recommended for its inconspicuous flower but is a very hardy, glossy, evergreen ground cover, six to ten inches tall.

**Day Flower** (*Commelina coelestis*, or *C. nudiflora*), allied to the Wandering Jew, is more erect and has bright blue flowers Summer and Fall. It requires sun to partial shade. Seeds (good ones are available from Rex D. Pearce, Moorestown, N. J.) may be planted in the box, for this is an easily-grown plant and may even become too rampagous.

Two plants not mentioned in the City Gardens Club List, which have nevertheless been grown successfully in city window boxes, are *Fuchsia* and *Lantana*.

**Fuchsia** blooms in full shade, all Summer, and can be cut back and brought indoors before frost. There are double varieties and a choice of color combinations. Fuchsias often lose their leaves and buds at first, but will recover quickly and put out new foliage and flowers. Watch for white fly.

**Lantana** can be relied upon to bloom until frost. It prefers sun, but can do well with a few hours of afternoon sun, though there will be fewer flowers. The flower heads, which resemble Verbena, are usually in two colors: orange and yellow; red and orange; lavender and

### WINDOW BOX REPLACEMENTS

Replacements are necessary for sunny boxes planted to annuals. Three changes may be necessary for continuous bloom from Spring to Fall. In earliest Spring: pots of Tulips, Hyacinths and Daffodils, well started. (Don't try to plant bulbs in the box in Fall.) Interplanted with the bulbs: English Daisies and Pansies. (English Ivy is planted early.)

These are replaced with Summer-blooming annuals. Lantana is the only Summer-blooming annual which will carry on till frost.

Potted Chrysanthemums and Asters may be used to replace Summer bloomers.



pale yellow; but sometimes all white. The plant is susceptible to mealy bug, but unless this is neglected it does not seem to weaken Lantanas as much as it does other plants.

## Combinations of Plants for Effect

### FOLIAGE ARRANGEMENTS

#### ANY SEASON; SUN OR SHADE

*Small Yews, Arborvitae or Box* as background; *English* (or *Baltic*) *Ivy* trailing over the front.

#### SPRING, SUMMER AND FALL; SUN OR SHADE

*Privet* as background; *Periwinkle* or *Pachysandra* in front.

*Japanese Aucuba* as background; *English Ivy*, *Grape Ivy* or *Wandering Jew* in front.

*Small Rubber Plants*, *Aucuba* and *Anthericum* as background; *English Ivy* in front. (This is for large boxes.)

### FOLIAGE AND FLOWER ARRANGEMENTS

#### SPRING; SUN OR HALF SHADE

*English Ivy* trained on a little trellis as background; *Begonia*, either interplanted with, or back of *Pansies*. (When the *Pansies* fade, the *Begonia* carries on through the Summer. Pinch the *Begonia* to keep it bushy.)

#### SPRING AND SUMMER; SUN OR PARTIAL SHADE

Red or pink *Geraniums* as background; *Wandering Jew* or *Ivy* in front.

#### SUMMER; SUN OR HALF SHADE

*Artemisia* as background; *Torenia* in front.

#### LATE SUMMER; SUN OR A LITTLE SHADE

*Showy Sedum* as background; may be interplanted with dwarf *French Marigolds*; *Asparagus Sprengeri* to trail in front. (If *Marigold* is used, full sun is required, and only the dusty pink *Showy Sedum* should be combined with it.)

Pink or white *Geraniums* as background; blue *Edging Lobelia*, *Periwinkle* in front.

Watermelon pink or red *Geraniums* with a few purple *Petunias* as background; *Kenilworth Ivy* in front.

#### SUMMER; FULL SUN

Pale blue and dark purple *Petunias*, blue and pink *Drummond Phlox* as background; *Phlox*, *German Ivy* in front.

*Dusty Miller* as background; purple *Petunias* in front.

*Lantanas* as background; *Sweet Alyssum* to trail in front.

*Drummond Phlox*; with *English Ivy* on a trellis for background, or *Nepeta* to trail in front.

#### FULL SHADE OR A LITTLE MORNING SUN

*Fuchsias* as background; *English Ivy* in front.

# YOUR CHILD

by Dr. Joseph Lander

Feeding problems and thumbsucking are discussed in this article, the third in a series by a psychiatrist

When solid food is introduced into the infant's diet for the first time, some feeding problems are likely to arise. One reason for this is the infant's suspicion of anything new. Usually a whole group of new elements is introduced into the feeding routine at the same time that solid food is first presented. For example, if the infant has had no previous experience with a spoon, that in itself will tend to make him wonder what is going on. In addition, solid food not only has a consistency different from that of milk, orange juice or water, but it also has a new taste.

It is therefore a good plan to offer orange juice from a spoon from time to time after the infant has become accustomed to taking it from the bottle or cup. In this fashion, a substance to which he is accustomed—the orange juice—is taken by means of a new tool—the spoon.

As regards the introduction of solid foods, some outstanding pediatricians, including Dr. Benjamin Spock, strongly recommend that the first food should be one to which the child is likely to respond favorably. Most infants like the taste of applesauce or mashed banana, and they will generally accept a spoonful or so each day without protest. After a few days the amount can be increased rapidly without arousing the infant's suspicion or resentment. Within a few weeks thereafter, introduce cereal and pureed foods in similar fashion. In fact, once the child has learned to take one solid such as fruit, other solid foods are most unlikely to create difficulties. On the other hand, if cereals are the first solid food offered, one may encounter resistance. If this occurs, the same principle applies as was mentioned in last month's article: in the face of resistance by the child, be guided by his judgment rather than by your own, and yield for the time being. You can try the same item again a week or two later.

### THUMB SUCKING

Thumbsucking is closely tied to the whole problem of feeding. In nursing, whether at breast or bottle, the infant satisfies not only his need

for food but also an instinctive, "constitutional" need for sucking for its own sake. The strength of this need varies considerably with different children. A few satisfy the need completely in the act of getting the amount of food they want, but most children will satisfy their hunger before having satisfied the sucking need. As a result, they will tend to suck or chew on the corner of the blanket, or struggle clumsily to get a finger into the mouth. It can be taken for granted that children will suck their thumbs for shorter or longer periods, as a normal activity.

The first few months of life are usually of great importance in determining whether or not the infant will carry over his thumbsucking into later childhood. If the infant of two or three months were sufficiently well coordinated so that he could get his thumb into his mouth at will, and suck to his heart's content, it is very likely that the vast majority of children would soon "saturate" the sucking need, and there would be far fewer thumbsuckers among older children. But it is precisely when he most needs the sucking that the infant is too clumsy to get his thumb into his mouth. For this reason the use of a "pacifier" or frequent use of water given by nipple should be encouraged in those first few months.

The child of three or four whose thumbsucking is ignored and who has the opportunity for adequate play and adequate satisfactions in his relationship to the other members of the family, has an excellent chance of growing out of the habit without outside interference. The use of such devices as obnoxious-tasting or foul-smelling substances on the fingers, or elbow cuffs which hold the arm rigidly extended and thus prevent him from getting his thumb to his mouth, or mittens tied on the hands—these and other such methods are likely to aggravate the problem or to produce a new one. There is considerable difference of opinion as to whether thumbsucking actually has any effect in altering the bite of the teeth. It is not proved that dental disfigurements result from it.

# What About Sunbathing?

*CU's Medical Adviser discusses the pros and cons, and issues some warnings on the dangers of excess*

There seems to be a growing belief among the American people that sunlight has marvelous, if mysterious, effects on man's vital processes. To this end, chests and backs are bared on the beaches and in the back yards from Spring to Fall; in the Winter, those who are not lucky enough to hasten South with the Sun cast speculative eyes on sunlamps to carry them through sunless days.

Actually, the only clear-cut, unequivocal and generally beneficial effect known to be produced by exposure of the human skin to the sun is the formation of vitamin D in the body. Sunlight is also occasionally helpful in certain skin diseases, particularly skin tuberculosis. But sunlight does not prevent colds or flu. It does not lower high blood pressure or raise low blood pressure. It does not cure baldness, anemia, arthritis or rheumatism. It does not, moreover, stimulate metabolism to any considerable degree. Not only does it not do all these things, but, more important, it may even harm the skin and interfere with the activity of certain organs of the body.

## WHAT SUNLIGHT IS

Sunlight consists of three varieties of radiation—ultraviolet, visible and infrared. Ultraviolet has the shortest wave lengths, visible the intermediate, and infrared the longest. The infrared radiation provides the heat, the visible radiation is what we actually see of the sun, and the ultraviolet is responsible for skin tanning and other biological effects in the human body.

The most important positive effect of ultraviolet light on the body is the formation of vitamin D in the skin. Ultraviolet light acts on a fatty substance (a "sterol" known as 7-dehydrocholesterol) in the superficial layers of the skin. A photochemical reaction occurs, which results in the formation of activated dehydrocholesterol, or vitamin D. The vitamin is then absorbed into the blood and lymph and is carried to the tissues of the body, where it is stored and then released gradually to play an important role in the growth, develop-

ment and maintenance of bony and connective tissue. The amount of vitamin D produced as a result of a Summer's sun bathing is more than is needed at one time, and most of it is stored in the liver for use by the tissues during the sunless months. Eskimos, who get little sunlight or ultraviolet radiation, get plenty of vitamin D from their rich fish diets. Many fish, particularly those of the cod, percomorph and halibut families, make large amounts of vitamin D which is stored in their livers and their flesh. Fish liver oils are, therefore, a rich source of vitamin D. The vitamin is also formed by the action of ultraviolet rays on the vegetable sterol, "ergosterol." Ergosterol activated by ultraviolet light is known as viosterol, and is used as a source of vitamin D.

Infants need vitamin D to prevent rickets and promote proper bone formation. They can get enough from a fish liver oil or viosterol. Irradiated or enriched milks are also good sources of vitamin D. In fact, there are many good and cheap sources of vitamin D.

It is true that sun bathing does tend to give a feeling of vitality and relaxation to the sun bather. But this feeling is not due to any specific action of the sunlight on vital processes of the body. Rather it results from the accompanying freedom from work, the exposure to the air, the bland wind, the feeling of nakedness on sand or ground, the tingling warmth caused by infrared rays and a mild sunburn, the exercise in the open air, the after-swim relaxation in a warm environment. These and other physical and psychological factors are responsible for the lift in spirits and the sense of well-being associated with the sun bath. The vitamin D which the sunlight forms has nothing to do with the sense of well-being during and after a sun bath, since the vitamin acts over periods of months rather than hours or days.

Sunlight can be a menace as well as a benefactor, particularly to the many people who feel that they really

don't get benefits from sun bathing unless a couple of layers of skin are shed in the process.

Sunburn, which results from excessive sun exposure, produces changes in the skin that are essentially the same as those occurring in an inflammation or a burn of the skin caused by contact with a hot object. The blood vessels in the deeper layers of the skin become dilated, fluid oozes out under the superficial layer of the skin, and white blood cells (leucocytes) migrate into this superficial layer. According to Dr. Harold F. Blum, an authority on the effects of sunlight, a number of other physiological changes are associated with severe sunburn. The surface temperature of the skin is raised; the rate of evaporation of water in the system is disturbed; there are changes in the electrical potential of the skin, together with disturbances in enzymatic activity.<sup>1</sup>

If the sunburn is not severe and the skin surface is not destroyed, the reddened skin is gradually replaced by tan—the grand finale of the sunbathing ritual. This tan results from a change in the quantity and distribution of a normal pigment of the skin—melanin. In the untanned skin, the pigment is located chiefly in the cells of the "basal-cell layer." With tanning, the pigment migrates into the more superficial layers of the skin. In addition, new melanin is formed from a precursor—tyrosine. It is believed that some of the darkening of the skin is also caused by special pigment changes, the exact chemistry of which has not yet been worked out.

After it has acquired a tan, the skin is relatively immune to sunburn because of the protective effects of the melanin in the thickened superficial layers of the skin. In the skins of Negroes, according to Dr. Blum, "the pigment is much more uniformly distributed throughout the epidermis than in the skins of the white races, and this, no doubt, accounts in part for the relative immunity of the Negro to sunburn." Susceptibility to sunburn and sun tan varies considerably among different individuals. In general, red or blond complexions are more sensitive to sunlight than are brunet skins.

<sup>1</sup> "The Physiological Effects of Sunlight on Man," *Physiological Reviews*, July 1945, p. 483.



It is common experience that the intensity of a burn does not necessarily depend on the brightness of the sunlight alone. Ultraviolet radiation comes not only directly from the sun, but also indirectly from "sky radiation." On an overcast day, scattered sunburn-producing radiation may be many times more intense than direct radiation, and thus cause a severe sunburn. Many people have received bad burns when protected from direct exposure to the sun but unprotected from sky radiation.

Not only does sunlight cause burning and tanning of the skin, but it can also produce profound effects on the temperature-regulating mechanism and the circulation of the body. Heatstroke is a common and possibly even fatal by-product of prolonged exposure to the sun. It was formerly believed that "sunstroke" differed from heatstroke because it was apt to occur only when the head was directly exposed to the sun's rays. It is now believed that sunstroke is not essentially different from heatstroke.

Sunstroke occurs in the same way as a stroke from exposure to intense heat from any other source, as from a blast furnace. If water and salt are not replaced, dehydration and heatstroke occur.

Because of these profound general effects of heat on the body, elderly

persons and persons with heart disease should not expose either head or body to strong sunlight over prolonged periods.

Sunlight can also produce injurious effects on the eyes. Permanent and serious damage to the retina and possibly to other structures of the eye can occur from looking directly at the sun or at artificial sources of ultraviolet light. Smoked glasses offer protection, provided they are quite dark. Red glasses do not protect against infrared rays which can "burn" the retina.

Doctors employ ultraviolet rays chiefly in the treatment of certain skin diseases. Thus, in many cases of acne, furunculosis and psoriasis, judicious exposure to sunlight may result in at least temporary improvement. In tuberculosis of the skin, sunlight has been of great value.

Sunlight exposure is bad, or "contra-indicated," as doctors say, in cases of "lupus erythematosus" and in patients who are receiving certain drugs such as the gold salts and sulfa.

Furthermore, it is the belief of many experts, including Dr. Blum, that "sunlight is the major cause of cancer of the skin." Cancer of the skin—a disease which affects about two persons in a thousand—occurs most frequently on the face and hands and about the lips, among

farmers or outdoor workers whose faces and hands are more or less continuously exposed to the irritant effects of sunlight. It is not likely to affect the Summer sun-bather. However, no one should expose himself to sunlight if he has an acute or chronic skin disorder or if he has had X-ray skin treatments. The best course under these circumstances is to consult a skin specialist, and to ask him specifically whether sunlight might aggravate the disease.

If you have no skin disorders, and if you are in generally good health, go ahead and take your sunbaths—but in moderation. Moderation will, of course, mean different things to different people. For a person with a light skin, five minutes in strong sunshine may be too much; for one with dark skin which tans easily, a half hour in the sun may bring no untoward results. But even dark persons will do well to play safe, and take their first exposures to sunshine for only short periods at a time, gradually lengthening the exposure periods.

But in any case, neither sun nor sunlamp can do more for the normal person than form some vitamin D in the body, and produce a tanned skin. You can easily get the vitamin D from other sources, and a tan is important to you only if you think it is important.

## CUMULATIVE INDEX

Each issue of the Reports contains this cumulative index of principal subjects covered since publication of the 1946 Buying Guide issue. By supplementing the Buying Guide index with this one, members can quickly locate current material and keep abreast of changes resulting from new tests. Page numbers run consecutively beginning with the January 1946 issue: Jan. 1-28, Feb. 29-56, Mar. 57-84, Apr. 85-112, May 113-140.

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